

# HARFORD COUNTY BOOK OF STANDARD DETAILS

May 1, 2007

HARFORD COUNTY  
BOOK OF STANDARD DETAILS

**HARFORD COUNTY BOOK OF STANDARD DETAILS**

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## SECTION 1

### GENERAL DETAILS

#### Plate

Soils and Soil – Aggregate Mixture Designs


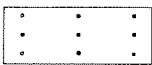
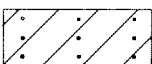

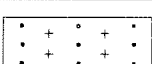
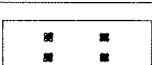
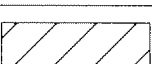
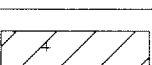
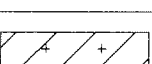
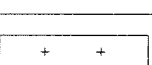
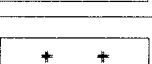
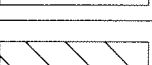
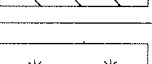

Designations..... G-1

Soils and Soil – Aggregate Mixture

Characteristics and Performance..... G-2

Soils and Soil – Aggregate Mixes

Treatment and Usage ..... G-3

A-3 SAND		L.L. = N.P. P.I. = N.P.	SAND-53% MIN. %-#200-20% MAX. P.I.-N.P. L.L.-MUST BE N.P.
A-2 SAND/FINES		L.L. = 22 P.I. = 2 S.L. = 18	SAND-53% MIN. %-#200-20% MAX. P.I.-7 MAX. L.L.-34 MAX. (MUST HAVE L.L.)
A-2-4 SILTY SAND		L.L. = 24 P.I. = 2 S.L. = 21	SAND -53% MIN. %-#200-21% MIN-30% MAX P.I.-7 MAX. L.L.-34 MAX (MAY BE N.P.)
A-4-2 SANDY SILT		L.L. = 25 P.I. = 3 S.L. = 21	SAND-48% MIN. %-#200-31% MIN. P.I.-7 MAX. L.L.-40 MAX (MAY BE N.P.)
A-2-7 CLAYEY SAND		L.L. = 31 P.I. = 10 S.L. = 18	SAND-48% MIN. CLAY-29% MAX. P.I.-8-14 L.L.-40 MAX.
A-7-2 SANDY CLAY		L.L. = 39 P.I. = 17 S.L. = 16	SAND 48% MIN. CLAY-17%-35% P.I.-15 MIN. L.L.-30 MIN.
A-4 SILT		L.L. = 30 P.I. = 6 S.L. = 19	SAND 47% MAX. CLAY 29% MAX. P.I.-9 MAX. L.L.-40 MAX.
A-4-7 CLAYEY SILT		L.L. = 33 P.I. = 11 S.L. = 18	SAND-47% MAX. CLAY-25% MIN. P.I.-14 MAX. L.L.-40 MAX.
A-7-4 SILTY CLAY		L.L. = 39 P.I. = 15 S.L. = 16	SAND-47% MAX. CLAY-29% MAX. P.I.-15 MIN. L.L.-30 MIN.
A-7 CLAY		L.L. = 40 P.I. = 17 S.L. = 15	SAND-47% MAX. CLAY-30%-59% P.I.-15 MIN. L.L.-35 MIN.
A-6 COLOIDAL CLAY		L.L. = 50 P.I. = 33 S.L. = 14	CLAY-60% MIN. P.I.-25 MIN. L.L.-45 MIN.
A-5 MICA, DIATOMS DECOMPOSED ROCK		L.L. = 35 P.I. = 4 S.L. = 26	GRAD. NOT SIGNIFICANT P.I.-LOW L.L.-HIGH S.L.-26 MIN. (VISUAL INSPECTION NECESSARY FOR TYPE)
A-8 SWAMP MUCK		L.L. = 52 P.I. = 7 S.L. = 38	ORGANIC CONTENT-4% MIN. P.I.-LOW L.L.-HIGH, WHEN OBTAINABLE S.L.-26 MIN.
ROCK REFUSAL			

*W. C. Adams* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*U. Hudson Myers, III* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

SOILS & SOIL-  
AGGREGATE MIXTURE  
DESIGNATIONS

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE G1

GENERAL CLASSIFICATION	GRANULAR MATERIALS					SILT - CLAY MATERIALS											
	A-2	A-3	A-2-4	A-4-2	A-2-7	A-7-2	A-4	A-4-7	A-7-4	A-6	A-5	A-8					
GROUP CLASSIFICATION																	
GENERAL DESCRIPTION	SAND		SILTY-SAND	SANDY-SILT	CLAYEY-SAND	SANDY-CLAY	SILT	CLAYEY-SILT	SILTY-CLAY	COLLOIDAL CLAY	MICA, DIATOMS & SILT	SWAMP MUCK					
STABILITY	WHEN N.P., HIGH	IDEAL WHEN COMPACTED	GOOD WHEN DRY	GOOD WHEN DRY	GOOD WHEN DRY & PROPERLY COMPACTED	GOOD WHEN PROPERLY COMPACTED OR UNDISTURBED				POOR	GOOD TO POOR	NONE					
USE AS A BASE	FAIR	EXCELL.	FAIR	FAIR	POOR	UNSATISFACTORY											
USE AS A SUB-BASE	EXCELL.	EXCELL.	FAIR	FAIR	FAIR	UNSATISFACTORY											
USE AS A SUB-GRADE	EXCELL.	EXCELL.	FAIR	FAIR	FAIR	UNSATISFACTORY											
FILLS UNDER 50'	EXCELL.	GOOD	GOOD	POOR	FAIR		GOOD TO POOR			VERY POOR	POOR	UNSATISFACTORY					
FILLS OVER 50'	GOOD	GOOD TO FAIR	FAIR	POOR	FAIR		POOR TO VERY GOOD			VERY POOR	POOR	UNSATISFACTORY					
FROST ACTION	NONE TO LOW		MEDIUM	HIGH	MEDIUM		HIGH	MEDIUM TO HIGH		MEDIUM	HIGH	MEDIUM					
RANGE OF MAX. DRY DENSITY (AASHTO T-180) (PCF)	115 - 135	105-130	110 - 130	110 - 135	115 - 135		115-130	110-135	105-130	100-120	90-115	100-135					
RANGE OF OPTIMUM MOISTURE CONTENTS(AASHTO T-180)(%)	9 - 12	8 - 15	8 - 15	9 - 15	6 - 12		8 - 15	10 - 15	10 - 17	12 - 25	14 - 30	11 - 18					
REQUIRED COMPACTION (AASHTO T-180) (%)	92 - 95	92 - 95	92 - 95	92 - 95	92 - 95		92 - 95			≤ 95 %		WASTE					
COMPACTION METHODS	ROLLING WITH SMOOTH FACE TAMPER, RUBBER-TIRED ROLLER OR VIBRATORY COMPACTOR	TRACTOR DISKING OR VIBRATION	TAMPERING OF RUBBER-TIRED ROLLER	TAMPERING OR RUBBER-TIRED ROLLER	TAMPERING OF RUBBER-TIRED ROLLER							WASTE					
COMPACTION ABILITIES	GOOD WITH CLOSE CONTROL	GOOD	GOOD TO POOR	GOOD TO POOR	GOOD TO POOR		GOOD TO POOR			POOR	POOR	WASTE					
PUMPING ACTION			SLIGHT TO NONE				FAIR TO POOR			POOR		WASTE					
BEARING VALUE	EXCELLENT TO FAIR		GOOD TO FAIR				FAIR TO POOR			POOR		WASTE					
DRAINAGE	GOOD	DRAINS FREELY	FAIR TO PRACTICALLY IMPERVIOUS				FAIR TO IMPERVIOUS			POOR	IMPERVIOUS	POOR					

# NOTES:

A-2 TO A-3 SOILS: WHEN USED AS A BASE, PLASTICITY INDEX AND LIQUID LIMIT SHOULD NOT EXCEED 6 AND 25 RESPECTIVELY. BEST FOR SOIL-CEMENT STABILIZATION, GENERALLY 8 TO 12 % CEMENT BY WEIGHT WILL BE SUFFICIENT.

NON-PLASTIC A-2 TO A-3 SOILS: MAY REQUIRE VIBRATION FOR COMPACTION.

A-4 TO A-7 SOILS: FILLS SHOULD BE PLACED IN DRY SEASON.

A-4 SILTS: SUSCEPTIBLE TO SETTLEMENT AND EROSION.

A-5 SOILS: WHEN MICA IS PRESENT, VERY DIFFICULT TO COMPACT BECAUSE OF EXPANSION AND REBOUND.

A-6 SOILS (CLAY): WILL PUMP IN POROUS BASES FORMING CRACKS. FILLS WILL SETTLE OVER LONG PERIODS OF TIME. HIGH BANKS IN CUTS AND FILLS VERY LIABLE TO SLIDE.



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

## SOILS & SOIL-AGGREGATE MIXTURES CHARACTERISTICS & PERFORMANCE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE G-2

DIRECTOR OF PUBLIC WORKS DATE

DEP. DIRECTOR, PUBLIC WORKS DATE

TYPE	TREATMENT & USE
<u>A-2 SOILS :</u>	WELL GRADED TO POORLY GRADED SAND AND GRAVELS. GOOD BASE FOR MODERATE FLEXIBLE OR THIN RIGID PAVEMENT. GOOD FILL. FROST HEAVE, BREAK-UP IF PLASTIC. SOFTENS WHEN WET IF PLASTIC. USE BASE COURSE WHEN SUB-GRADE P.I. IS GREATER THAN 6. SUB-DRAINAGE EFFECTIVE. STABILIZE WITH BITUMEN, CHLORIDES, CEMENT OR ADMIXTURE SOIL.
<u>A-3 SOILS :</u>	CLEAN SANDS AND GRAVELS. IDEAL BASE FOR MODERATE FLEXIBLE OR THIN RIGID PAVEMENT. GOOD FILL. NO FROST HEAVE OR BREAK-UP. SUB-DRAINAGE ONLY THROUGH IMPERVIOUS SHOULDERS. STABILIZE WITH SOIL BINDER, BITUMINOUS, OR CHEMICAL ADMIXTURES.
<u>A-4 SOILS :</u>	SILTY SOILS. NOT GOOD FOR SURFACE. POOR BASE. ABSORBS WATER. UNSTABLE WHEN WET. BAD FROST HEAVE AND BREAK-UP. USE SUB-DRAINAGE AND/OR BASE AND SUB-BASE WITH FLEXIBLE PAVEMENT. USE BITUMINOUS SUB-GRADE PRIME. USE THICK CONCRETE PAVEMENT (7" TO 10") WITH STEEL REINFORCEMENT AND CRACK CONTROL.
<u>A-5 SOILS :</u>	ELASTIC SILTS. USE SUB-DRAINAGE AND/OR GRANULAR BASE AND SUB-BASE WITH BITUMINOUS SUB-GRADE PRIME. USE THICK CONCRETE PAVEMENT, REINFORCED WITH CRACK CONTROL.
<u>A-6 SOILS :</u>	CLAYS. IMPERMEABLE AND STABLE WHEN DRY AND UNDISTURBED (HARD CLAY). PLASTIC AND ABSORBENT IF DISTURBED. BAD PUMPING INTO POROUS BASE. MACADAM OR PAVEMENT JOINTS. SHRINKS OR CRACKS WHEN DRY. USE GRANULAR BASE AND SUBBASE. USE SUB-DRAINAGE ONLY WHEN MADE PERVIOUS BY CRACKS, ROOT HOLES AND LAMINATIONS. FROST HEAVE SLIGHT WHEN IMPERMEABLE, BAD WHEN PERVIOUS. USE SUB-GRADE PRIME. USE THICK, STRONG, DENSE FLEXIBLE PAVEMENT OR REINFORCED CRACK CONTROLLED CONCRETE.
<u>A-7 SOILS :</u>	EXPANSIVE, PLASTIC CLAYS. EXCESSIVE VOLUME CHANGE. BAD FROST HEAVE AND BREAK-UP. SUB-DRAINAGE NOT EFFECTIVE. USE THICK, DENSE, FLEXIBLE PAVEMENT WITH BASE AND SUB-BASE OVER SUB-GRADE PRIME OR REINFORCED CRACK CONTROLLED CONCRETE PLACED ON IMPERVIOUS PAPER.
<u>A-8 SOILS :</u>	MUCK AND PEAT. UNFIT FOR CONSTRUCTION PURPOSES. EXCAVATE TO SOLID STRATUM AND REPLACE WITH SELECTED FILL. DISPLACEMENT BY SUPERIMPOSED FILL IS DOUBTFUL. DISPLACEMENT BY EXPLOSIVE UNDER SUPERIMPOSED FILL IS SOMETIMES EFFECTIVE.

*L. Earl C. Fleming* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*R. Tubong Maysa, Jr.* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

# SOIL & SOIL-AGGREGATE MIXES TREATMENT & USE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE G-3

**SECTION II**

**BARRICADES**

Plate

Barricade  
Typical County Road Closure..... P-1



W16-1 MODIFIED  
18" X 18"  
SOLID RED  
REFLECTIVE

CENTERLINE

WHITE ON GREEN

W16-1 MODIFIED  
18" X 18"  
SOLID RED  
REFLECTIVE

1' - 5 1/2"  
APPROX.

SPAN

FUTURE ROAD

SPAN

BOLT & NUT

END SECTION

W BEAM SECTION

RAIL SPLICE

POST

GROUND/PAVEMENT SURFACE

SEE S.H.A. STANDARDS FOR HIGHWAYS  
& INCIDENTAL STRUCTURES FOR DETAILS  
OF CONNECTIONS, FIXTURES & ASSEMBLY

LENGTH OF BARRICADE NOTED ON PLANS  
CENTER TO CENTER OF END POSTS  
ALL SPANS TO BE EQUAL IN LENGTH  
NUMBER OF POSTS NOTED ON PLANS

BARRICADED ROADWAY FOR ODD NUMBER POST BARRICADE  
(FOR EVEN NUMBER POST BARRICADE CENTERLINE ROAD = CENTER SPAN)

MINIMUM NUMBER OF SPANS - 4  
MINIMUM NUMBER OF POSTS - 5  
MAXIMUM SPAN: 6' - 3"

\* WHEN THE GRADE BEYOND THE END OF PAVEMENT IS  
4:1 1' FLATTER FOR AT LEAST 100' THE GUARDRAIL  
SHALL BE REMOVED AND ONLY THE SIGNS INSTALLED.

HARFORD COUNTY, MD

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BARRICADE - TYPICAL COUNTY  
ROAD CLOSURE

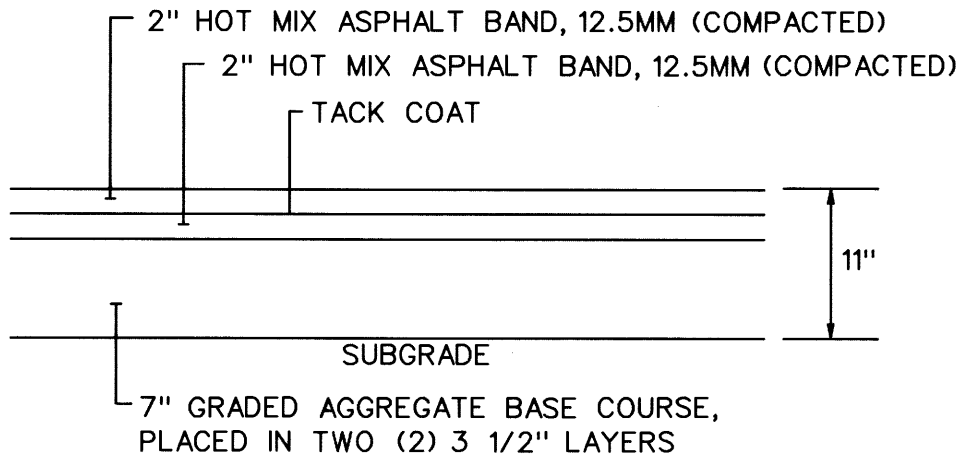
*[Signature]*  
DIRECTOR OF PUBLIC WORKS  
4/12/00  
DATE

ISSUED  
REVISSED  
REVISSED  
PLATE P-1

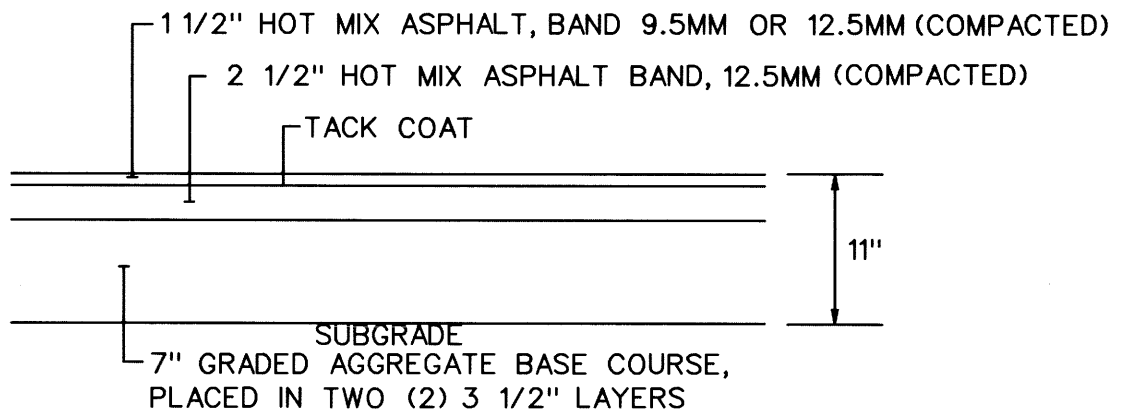
**SECTION III**  
**ROADS AND STREETS**

Plate

Residential and Townhouse Roads	
Paving Section .....	R-1 and R-1A
Business, Commercial, Industrial Roads	
Paving Section .....	R-2
Method of Cutting and Repairing Openings in Existing Roadways .....	R-3
Method of Cutting and Repairing a Road .....	R-4
Method of Cutting and Repairing a Gravel Road .....	R-5
Trenches Cradle and Encasement .....	R-6
Capping Existing Dug Wells .....	R-7



### ALTERNATE A



### ALTERNATE B

FOR NOTES SEE PLATE R-1A

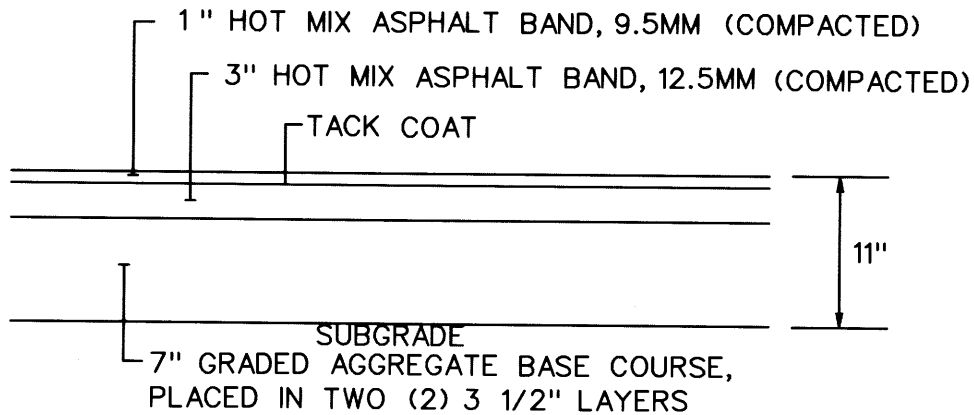
*Joseph R. G. Chalk* *PE 1/7/03*  
 DIRECTOR OF PUBLIC WORKS DATE  
*D. Hudson* *1/7/03*  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
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RESIDENTIAL &  
 TOWNHOUSE ROADS  
 PAVING SECTION

ISSUED 2/15/03  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE R-1



### ALTERNATE C

#### NOTES:

1. SUPERPAVE LEVEL 1 HOT MIX ASPHALT EQUIVALENT SIZE DESIGNATIONS  
SF -- 9.5 MM  
SC -- 12.5 MM
2. SUPERPAVE PERFORMANCE GRADE ASPHALT CEMENTS  
SHALL BE PERFORMANCE GRADES PG 64-22 AND DESIGNED  
AS LEVEL 1 MIXES @ 50 GYRATIONS N-DESIGN.
3. THE DIRECTOR MAY REQUIRE WETTING OF THE  
BASE COURSE BEFORE LAYING THE FIRST LIFT.
4. HARFORD COUNTY RESERVES THE RIGHT TO  
ENTER THE PROPERTY FOR THE PURPOSE OF  
TAKING "CORE BORINGS."

*Joseph R. Whaley, P.E.* 1/7/03  
DIRECTOR OF PUBLIC WORKS DATE

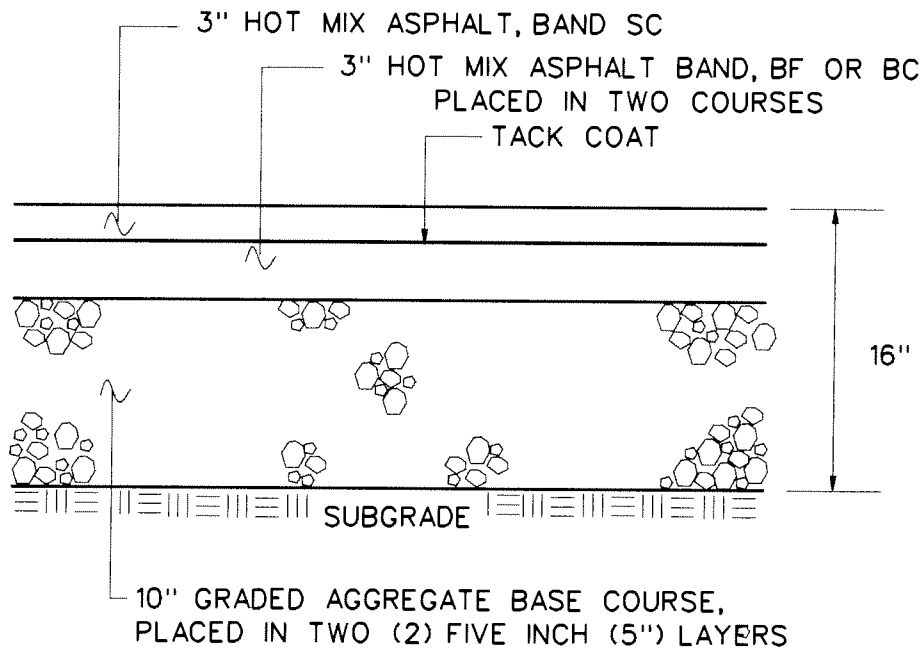
*D. Patrick Mayo, Jr.* 1/7/03  
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HARFORD COUNTY, MD  
DEPARTMENT OF  
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RESIDENTIAL &  
TOWNHOUSE ROADS  
PAVING SECTION

ISSUED 2/15/03  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE R-1A



**SUPERPAVE HOT MIX ASPHALT EQUIVALENT SIZE DESIGNATIONS**

SF -- 9.5 MM  
 SC -- 12.5 MM  
 BF -- 19.0 MM  
 BC -- 25.0 MM

SUPERPAVE PERFORMANCE GRADE ASPHALT CEMENTS SHALL  
 BE PERFORMANCE GRADE PG 70-22.

**NOTES:**

1. THE DIRECTOR MAY REQUIRE WETTING OF THE  
 BASE COURSE BEFORE LAYING THE FIRST LIFT.
2. HARFORD COUNTY RESERVES THE RIGHT TO  
 ENTER THE PROPERTY FOR THE PURPOSE OF  
 TAKING "CORE BORINGS."

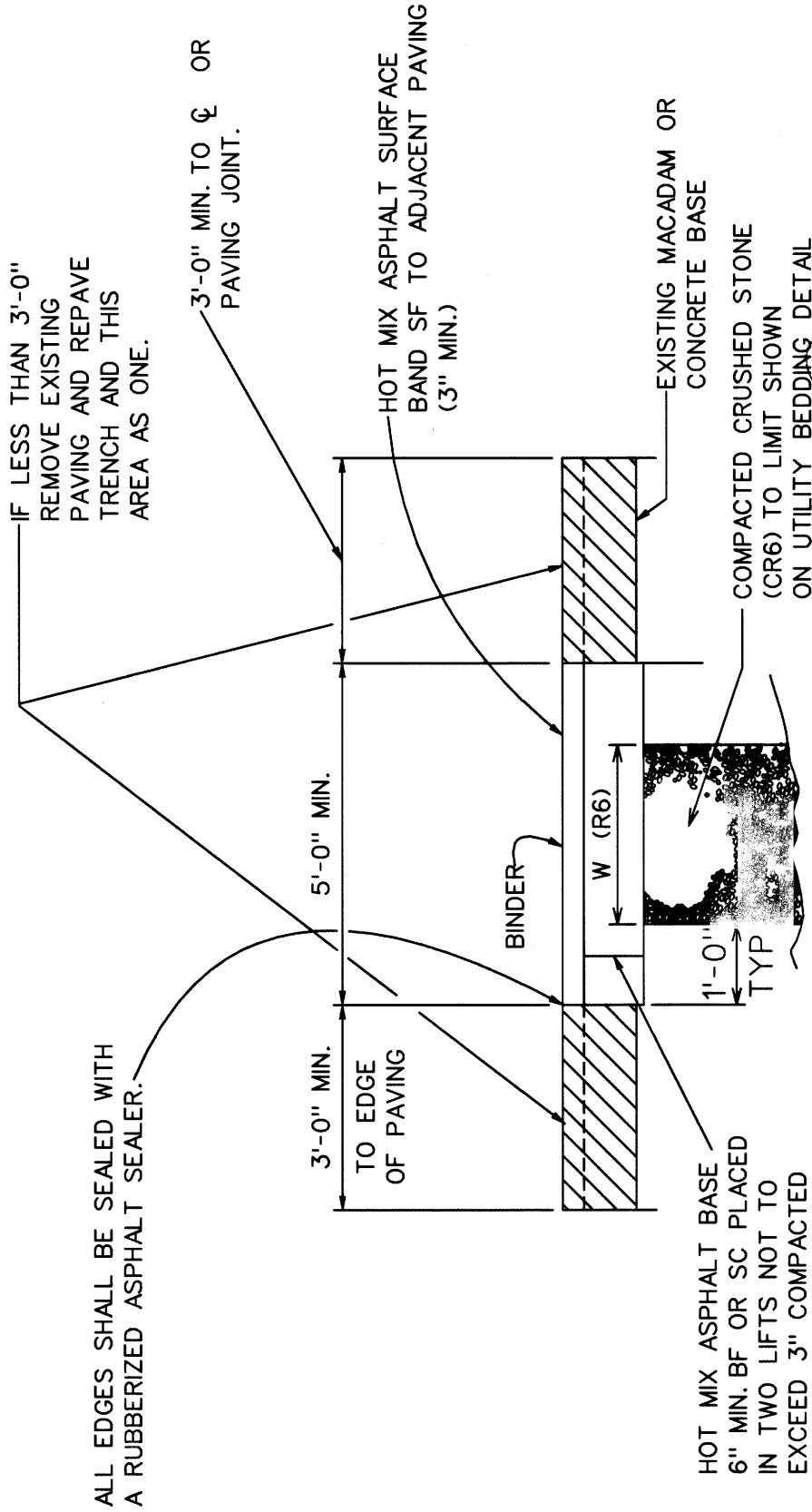
<i>Paul C. Adams</i>	5-200
DIRECTOR OF PUBLIC WORKS	DATE
<i>W. Hubert Mayne, II</i>	4/12/00
DEP. DIRECTOR, PUBLIC WORKS	DATE



**HARFORD COUNTY, MD**  
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**PUBLIC WORKS**

**BUSINESS, COMMERCIAL  
 AND INDUSTRIAL ROADS  
 PAVING SECTION**

ISSUED	_____
REVISED	_____
REVISED	_____
PLATE	<b>R-2</b>



NOTE: FOR TAR & CHIP ROADS USE 3" HOT MIX ASPHALT  
BF OR SC PATCH OR CR6

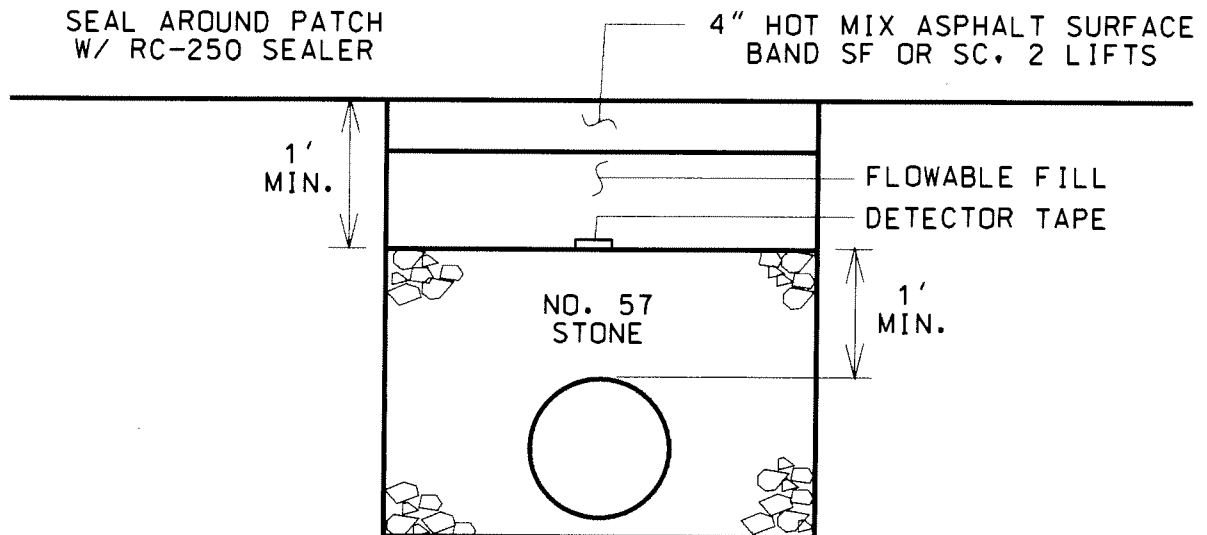
*Donald R. Whaley, PE* 1-7-03  
DIRECTOR OF PUBLIC WORKS DATE  
*D. Bullock* 1-7-03  
DEP. DIRECTOR, PUBLIC WORKS DATE

ISSUED 2/15/03  
REVISED  
REVISED  
PLATE R-3

# METHOD OF CUTTING AND REPAIRING OPENINGS IN EXISTING ROADWAYS



**HARFORD COUNTY, MD**  
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**PUBLIC WORKS**



NOTES:

FLOWABLE FLY ASH FILL FULL DEPTH (EXCLUDING 1' BEDDING) EXCEPT FOR LAST 4" OF HOT MIX ASPHALT SURFACE SHALL MEET AASHTO REQUIREMENTS.

TWO (2) TEST CYLINDERS TO BE PROVIDED TO HARFORD COUNTY MATERIALS AND TESTING SECTION AT 2220 ADY ROAD, FOREST HILL, MD 21050. PHONE NUMBER: 638-3562.

TRENCH TO BE COVERED WITH STEEL PLATES DURING THE CURING PERIOD OF 24 HOURS. PLATES SHALL BE PINNED AND RAMPED.

MAINTAIN ONE FOOT (1') VERTICALLY AND FIVE FEET (5') HORIZONTALLY FROM WATER AND SEWER LINES.

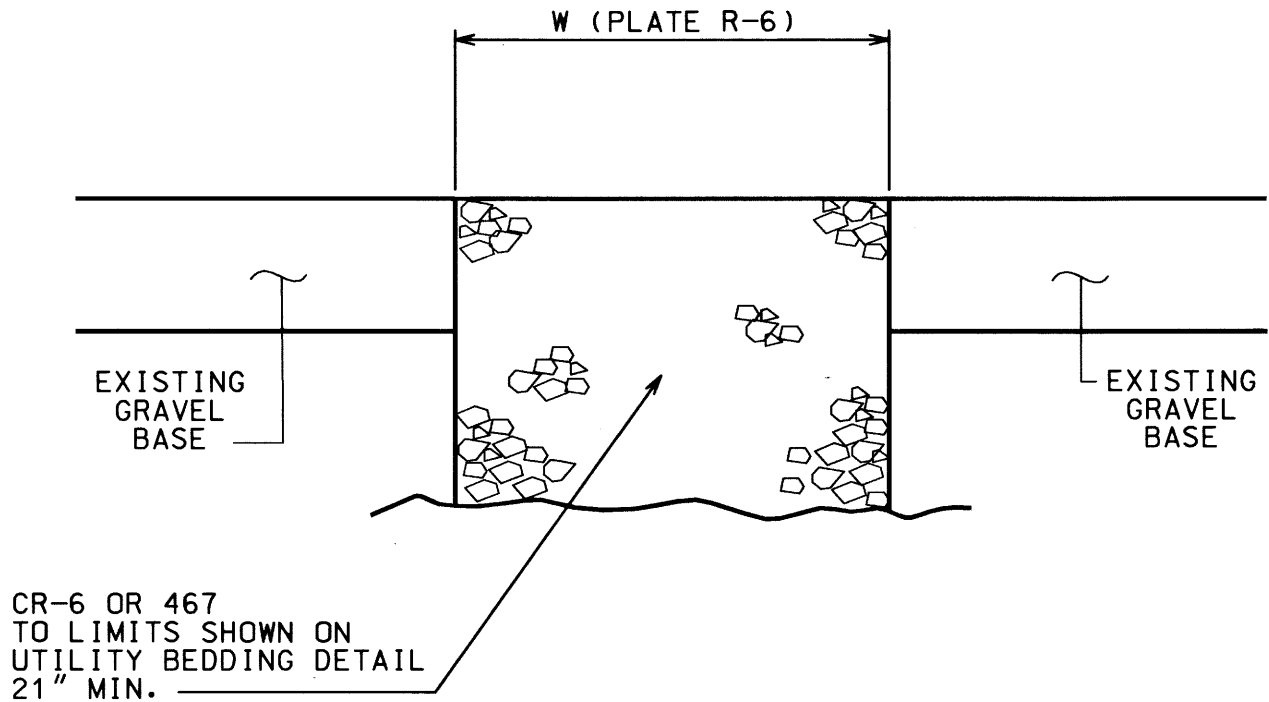
*L. R. C. Almont* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*W. J. Hinkley Myers, III* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
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METHOD OF CUTTING  
 AND REPAIRING A ROAD

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE R-4



NOTES:

SUB-GRADE BASE AND STONE  
BASE TO BE COMPACTED TO 95%  
OF MAXIMUM DESINTY PLACED IN  
LAYERS - NOT TO EXCEED 6" LIFTS.

BACKFILL SHALL MEET THE REQUIREMENTS  
OF SECTION 602.03.04 OF THE STANDARD  
SPECIFICATIONS FOR CONSTRUCTION AND  
MATERIALS.

*James R. A. [Signature]* 1-7-03  
DIRECTOR OF PUBLIC WORKS DATE  
*D. J. [Signature]* 1/7/03  
DEP. DIRECTOR, PUBLIC WORKS DATE

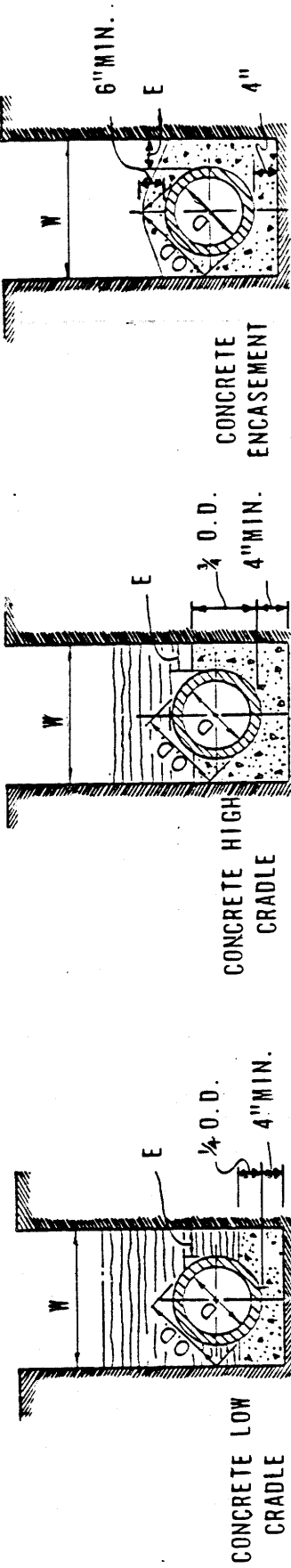


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METHOD OF CUTTING  
AND REPAIRING A  
GRAVEL ROAD

ISSUED 2/15/03  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE R-5





CONCRETE QUANTITIES - CU. FT. PER LINEAR FOOT

PIPE DIAMETER (D)	LOW CRADLE	HIGH CRADLE	ENCASEMENT
12"	1.62	2.65	4.03
15"	1.91	3.18	4.83
18"	2.22	3.73	5.66
21"	2.51	4.30	6.53
24"	2.85	4.88	7.42
27"	3.72	6.71	10.05
30"	4.12	7.45	11.17
33"	4.55	8.20	12.33
36"	4.98	8.98	13.53
42"	6.59	12.35	18.44
48"	7.67	14.26	21.38
54"	8.75	16.26	24.46
60"	9.97		
66"	11.24		
72"	12.55		

W=Cradle Payment Width  
(Trench Width)  
W=O.D. + 2E  
E=9" For 6" To 24" Pipes  
E=12" For 27" To 36" Pipes  
E=15" For 42" To 72" Pipes

NOTE: Quantities are for estimating only.



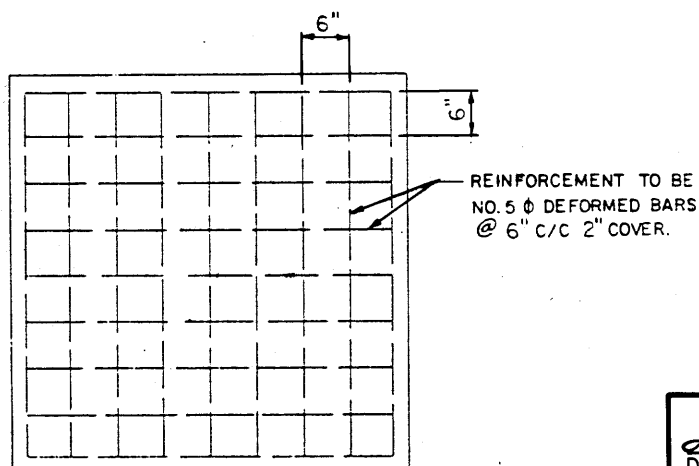
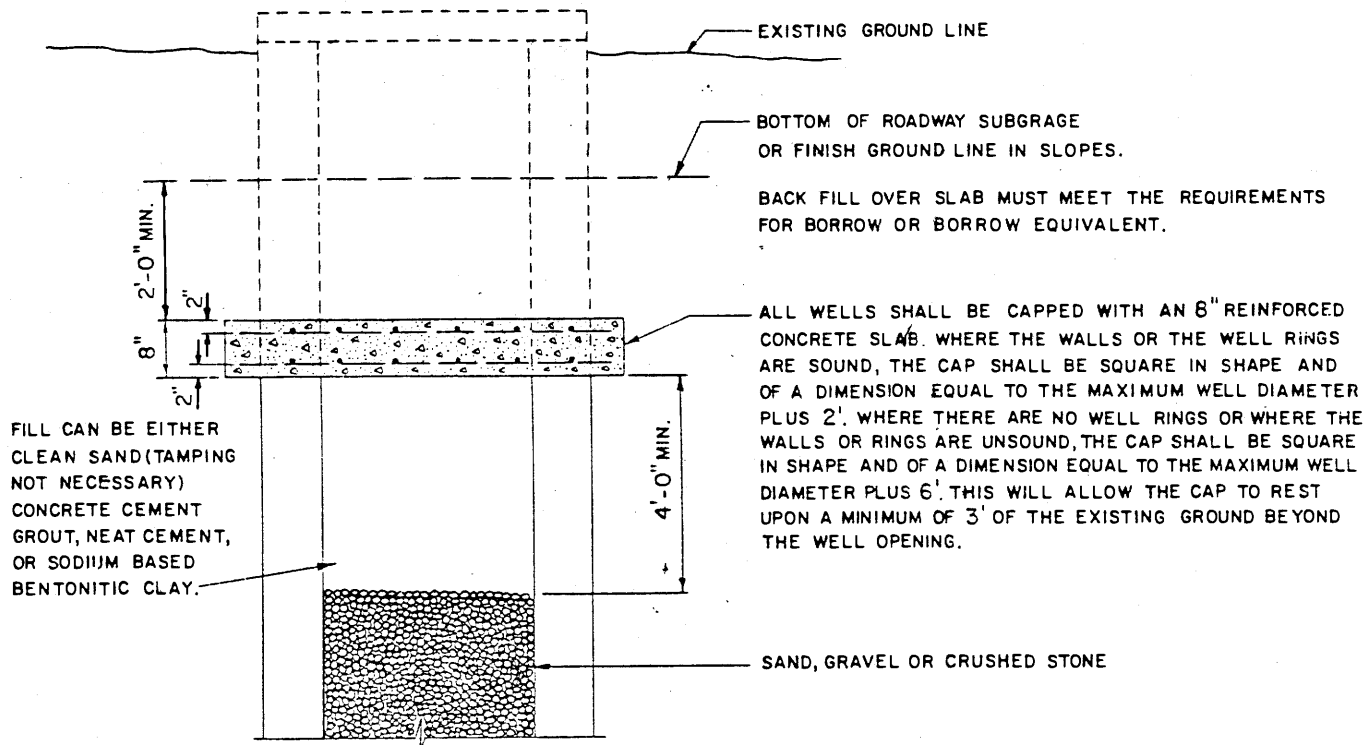
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TRENCHES  
CRADLE AND ENCASEMENT

*W. C. ALLEN, JR.*  
DIRECTOR OF PUBLIC WORKS  
DATE 5-2-00

*W. C. ALLEN, JR.*  
DEP. DIRECTOR, PUBLIC WORKS  
DATE 4/12/00

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE R-6



*J. J. Adams* 5-2-07  
 DIRECTOR OF PUBLIC WORKS DATE  
*W. Wilson* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

CAPPING EXISTING DUG WELLS

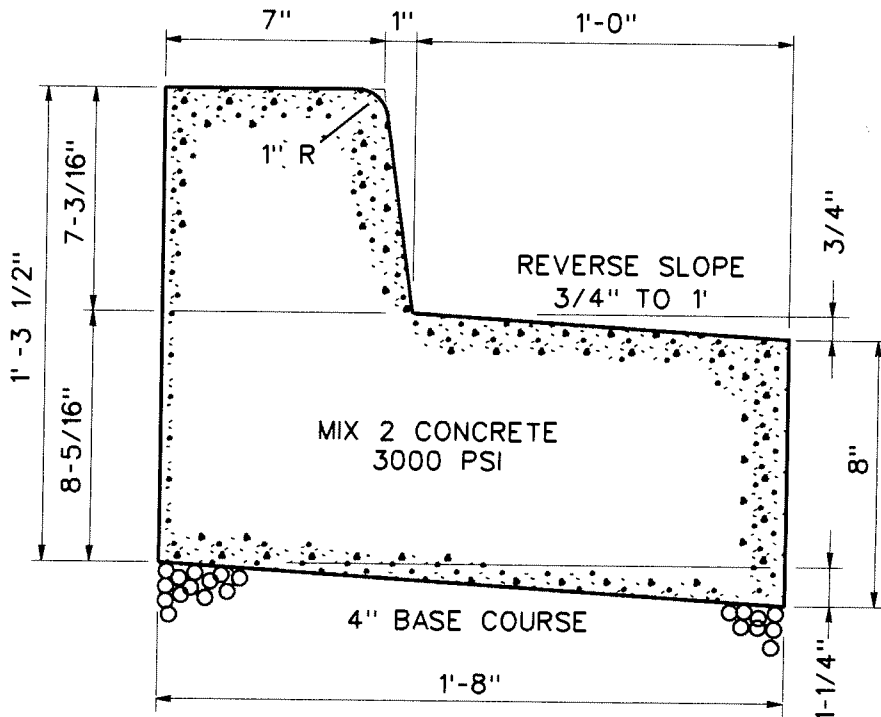
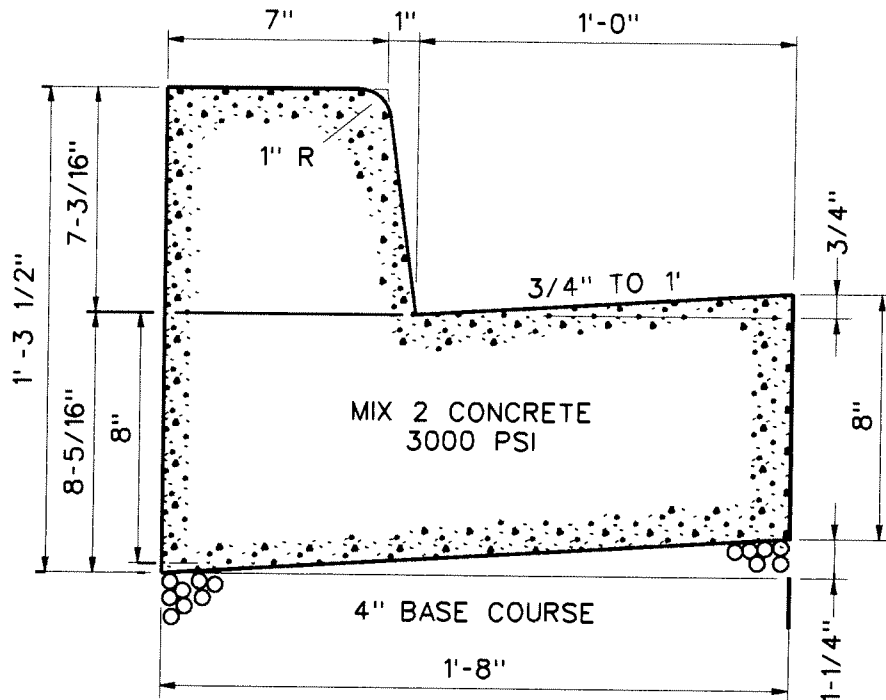
ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE R-7

## SECTION IV

### SHOULDERS

	<u>Plate</u>
7" Combination Curb and Gutter .....	S-1
Mountable Concrete Curb and Gutter .....	S-2
Mountable Concrete Curb and Gutter .....	S-3
Extruded Concrete Curb (Temporary Installations Only) .....	S-4
Standard Type "C" Combination Concrete Curb and Gutter .....	S-4A
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Typical Driveway Entrance for Extruded Curbed Street with Sidewalk .....	S-13
Typical Driveway Entrance for Open Section Road .....	S-14
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Curb and Gutter Transition at Inlets .....	S-30
Extruded Curb Transition at Inlets.....	S-31
Standard Curb Opening Detail – Curb and Gutter Section.....	S-32



AREA = 0.16 S.Y.

18.75 S.L.F./C.Y.

A BITUMINOUS SEAL SHALL BE PLACED AT  
ALL CURB JOINTS ALONG THE GUTTER PAN.

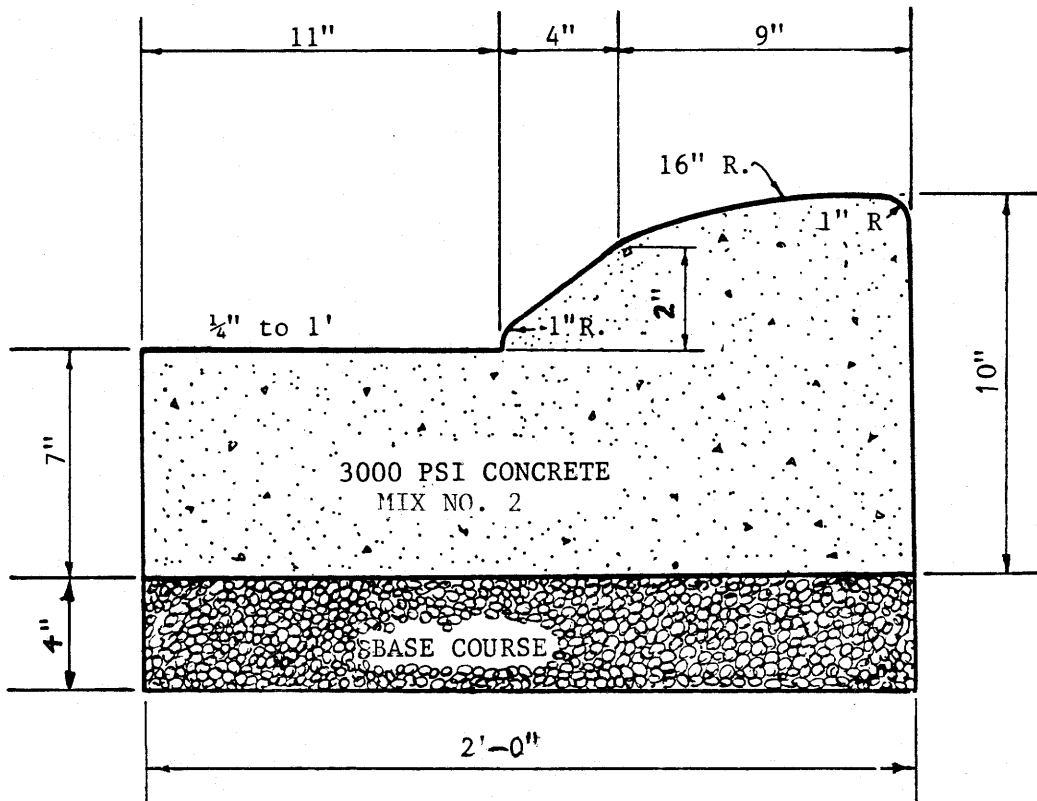
*[Signature]* 5-200  
DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

7" COMBINATION  
CURB AND GUTTER

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-1



CONCRETE MOUNTABLE CURB  
AND GUTTER

A bituminous seal shall be placed at all curb joints along the gutter pan.

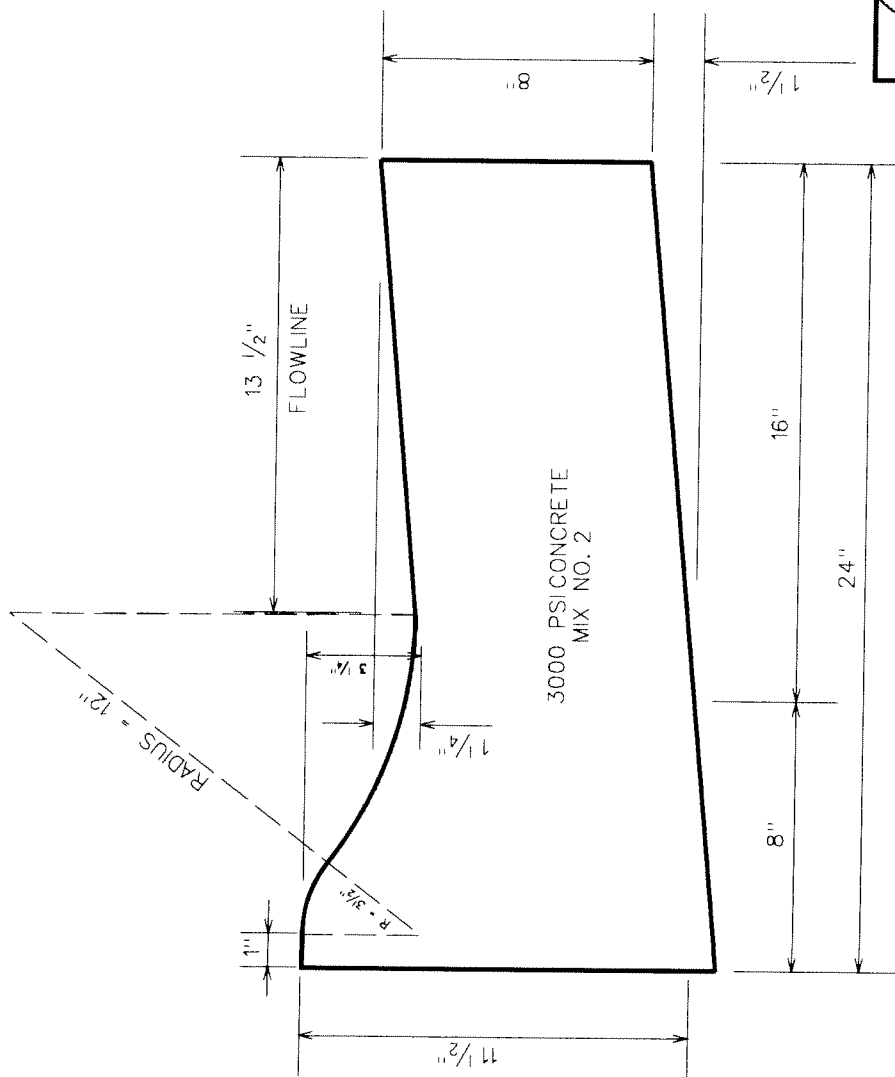
*Phil Allen* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*2. Hickory Mays, Jr.* 4/12/03  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

MOUNTABLE CONCRETE  
CURB & GUTTER

ISSUED \_\_\_\_\_  
REVISED 1/25/05  
REVISED \_\_\_\_\_  
PLATE S-2



W. C. A. S. G.  
 DIRECTOR OF PUBLIC WORKS  
 \$200  
 DATE

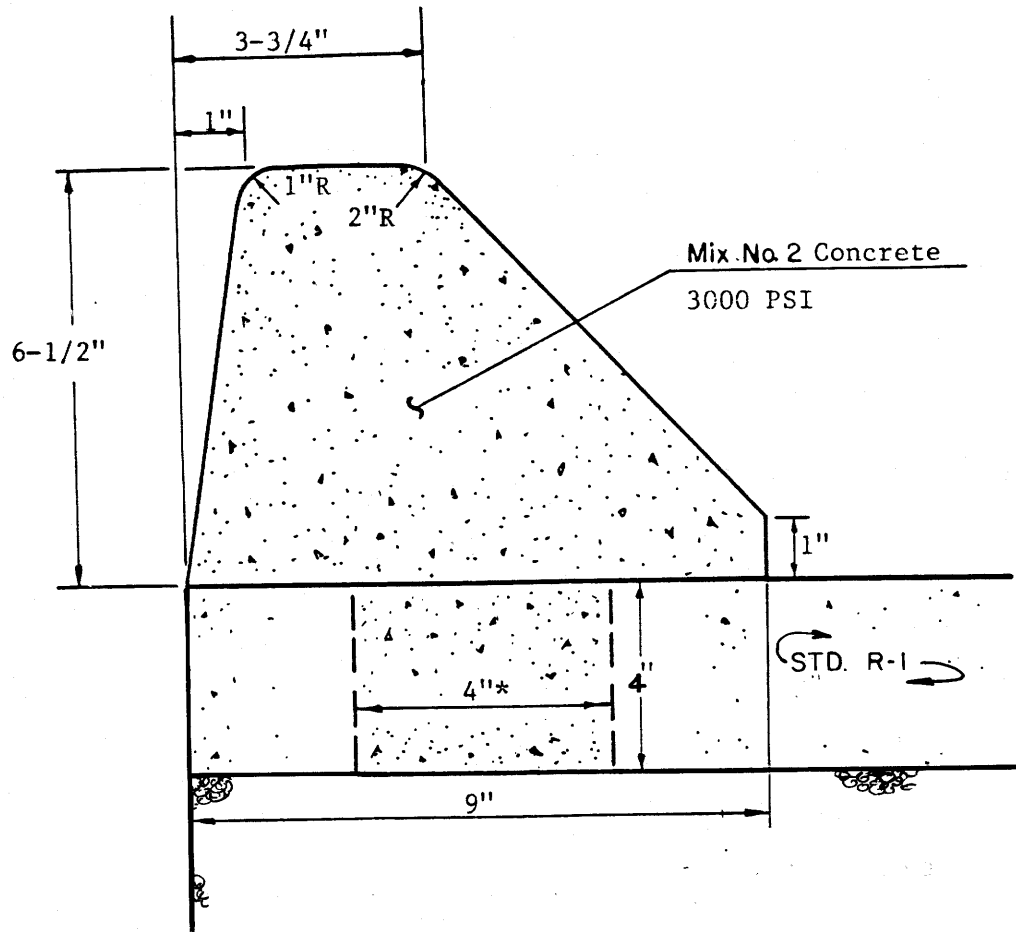
W. W. Underberg  
 DEP. DIRECTOR, PUBLIC WORKS  
 4/12/00  
 DATE

ISSUED	_____
REVISED	_____
REVISED	_____
PLATE	S-3

**CHARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS**



# MOUNTABLE CURB & GUTTER



\* 4"x4"x4" concrete key way spaced 4' on center will be required to anchor curb to pavement section. Expansion joint material, to be placed every 50' and at P.C.'s and P.T.'s of all curves.

*Phil A. [Signature]* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

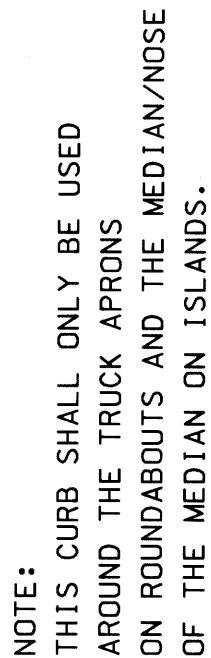


**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**EXTRUDED CURB**  
**(TEMPORARY INSTALLATIONS ONLY)**

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
**PLATE S-4**





THIS CURB SHALL ONLY BE USED

AROUND THE TRUCK APRONS

ON ROUNDABOUTS AND THE MEDIAN/NOSE

OF THE MEDIAN ON ISLANDS.

100 OK 1/2/03 1:7:03

11/10/10

D. Decker

## PUBLIC WORKS

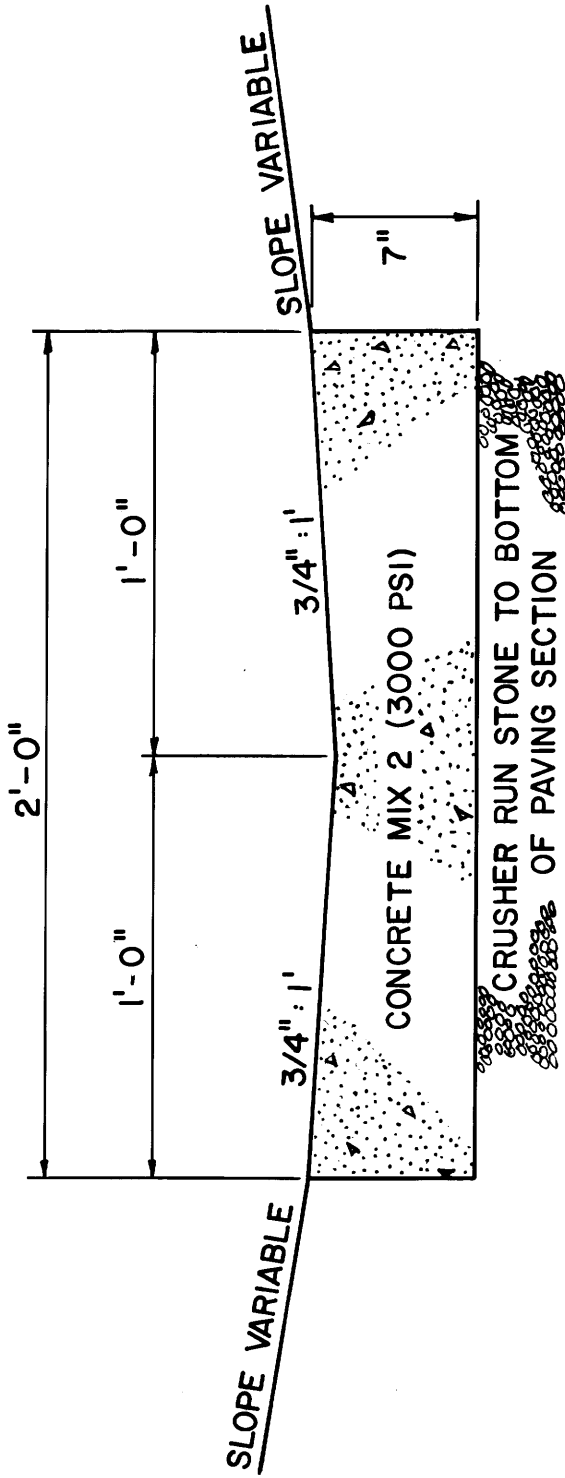
## STANDARD TYPE 'C' COMBINATION CONCRETE CURB & GUTTER

**ISSUED** 2115/03

**REVISED.**

**REVISED.**

**PLATE** S-4A



*W. J. C. A. L. S. 5-2-00*  
 DIRECTOR OF PUBLIC WORKS DATE  
*W. J. C. A. L. S. 5-2-00*  
 DEP. DIRECTOR, PUBLIC WORKS DATE

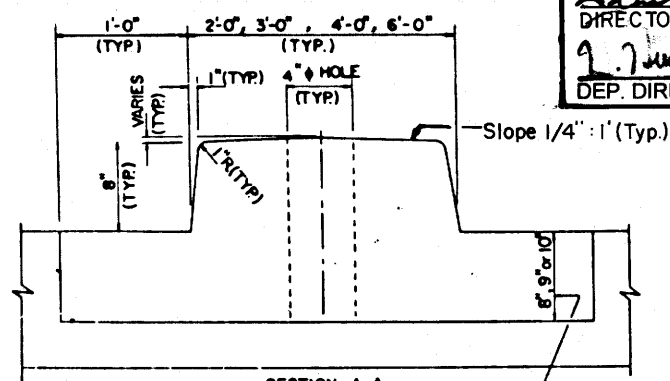
ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE S-5

VALLEY GUTTER  
 (FOR REPLACEMENT PURPOSES ONLY)

HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

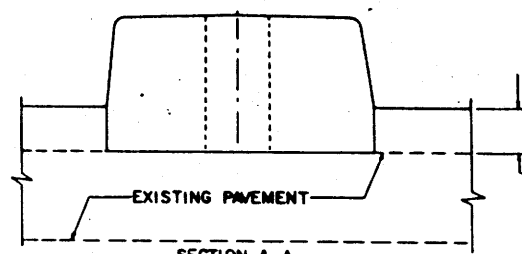


*Edward A. ...* 5-2-80  
 DIRECTOR OF PUBLIC WORKS. DATE  
*2. J. ...* 4/17/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

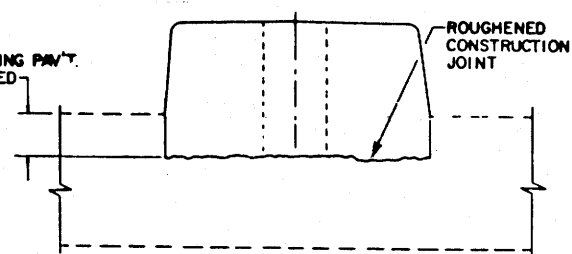


SECTION A-A  
**TYPE A-1**  
 PLACED WITH BITUMINOUS  
 CONCRETE PAVEMENT

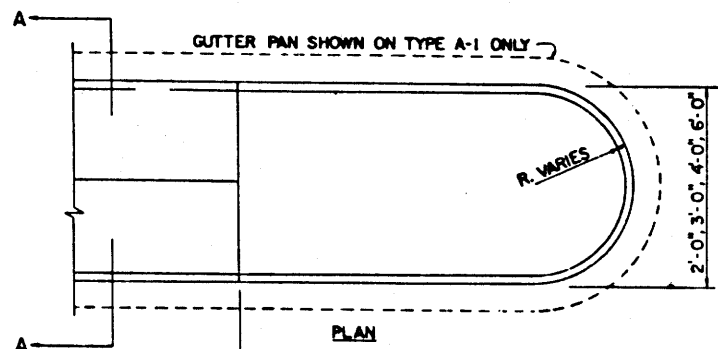
DEPTH OF GUTTER PAN TO  
 MATCH LAMINATIONS OF  
 PROPOSED PAVING SECTION  
 AS CLOSELY AS POSSIBLE



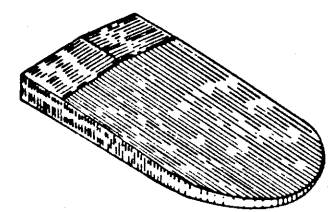
SECTION A-A  
**TYPE A-2**  
 PLACED IN COMBINATION  
 WITH PAVEMENT RESURFACING



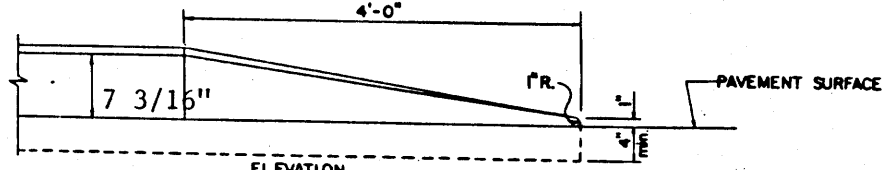
SECTION A-A  
**TYPE A-3**  
 PLACED ON EXISTING PAVEMENT



PLAN  
 END NORMAL SECTION BEGIN NOSE DOWN



ISOMETRIC-NOSE DOWN  
 (SHOWN WITHOUT GUTTER PAN)



ELEVATION  
**NOSE DOWN AT APPROACH END OF MEDIAN**

NOTES:

JOINT SPACING WILL BE A MAXIMUM OF 10'-0" APART. SEE SPECIFICATIONS FOR LOCATION AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED. IN THE CASE OF RIGID PAVEMENT, JOINTS SHALL MATCH PAVEMENT JOINTS.  
 ALLOW 4" Holes IN MEDIAN FOR SIGNS. SPACED AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

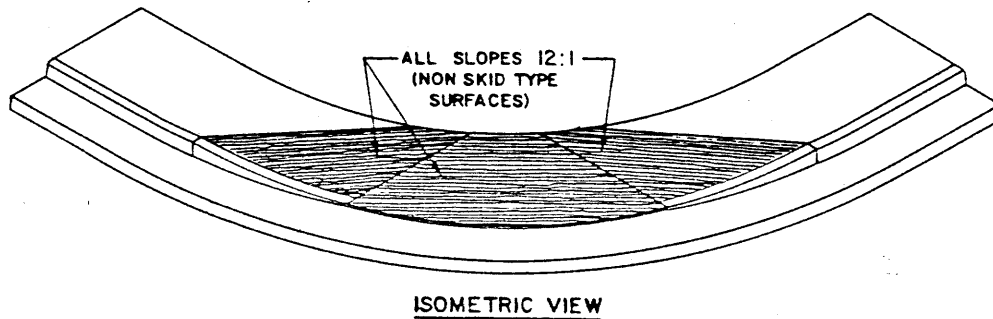
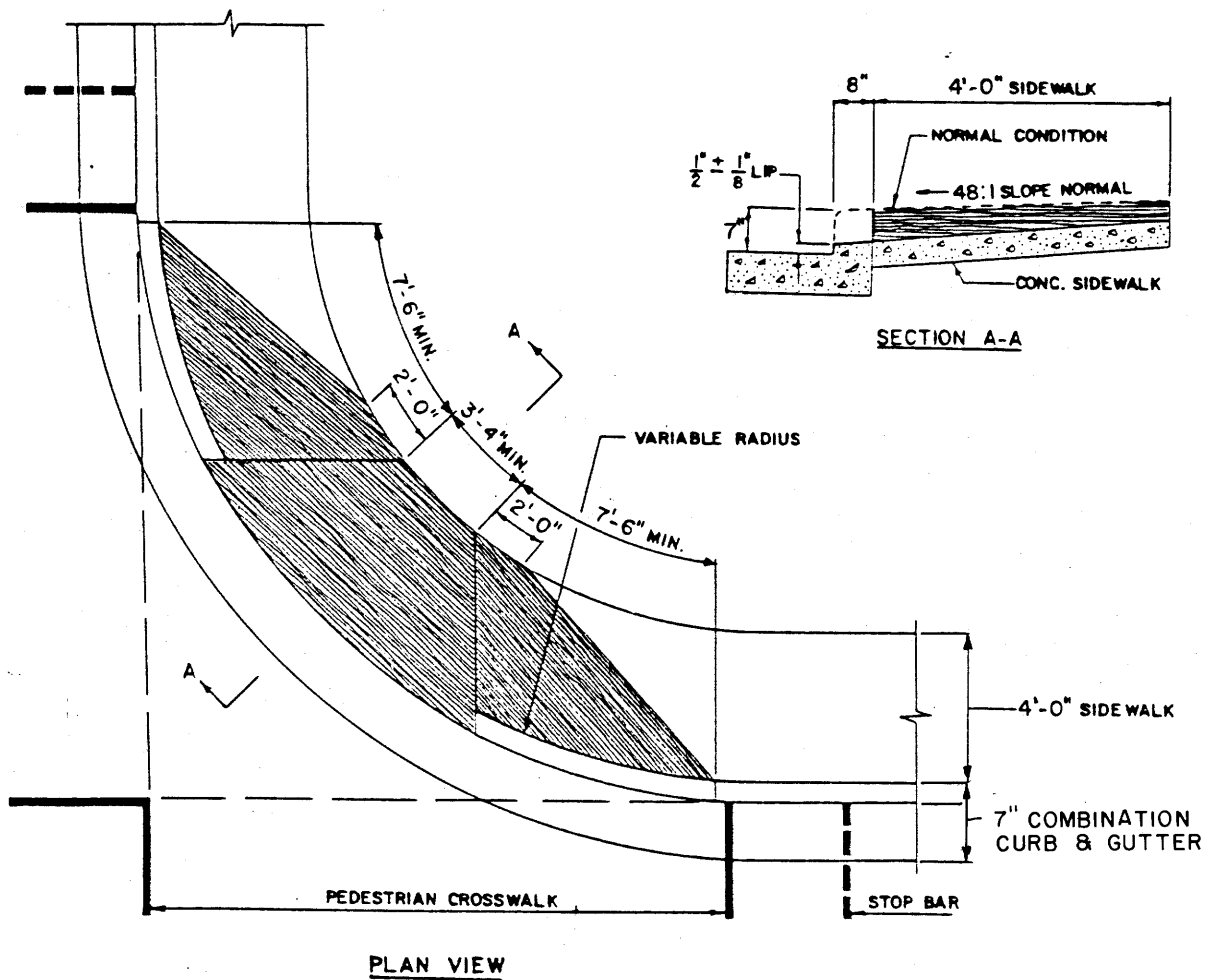


HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

STANDARD MONOLITHIC  
 CONCRETE MEDIAN

ISSUED OCT. 87  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE S-6





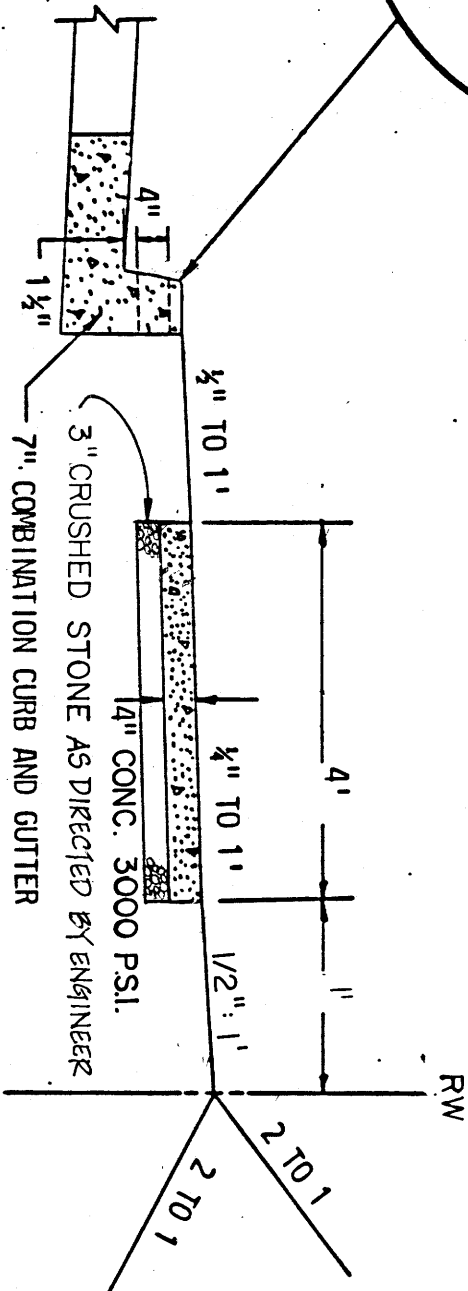
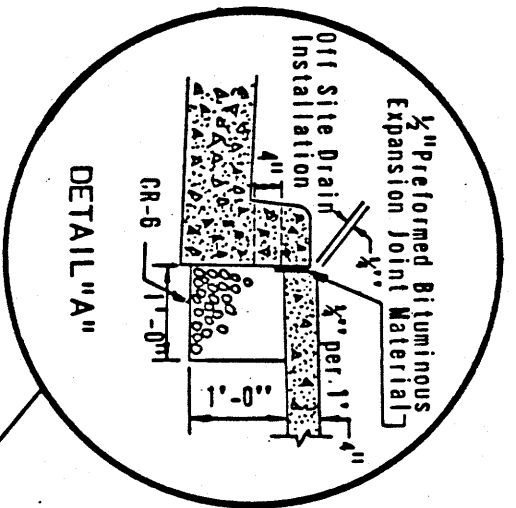
*J. L. Albert* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. W. W. W. W.* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

SIDEWALK RAMP W/ PLANTER  
WIDTH  $\leq$  2.0 FT.

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-8



# NOTES:

1. Sidewalk to be scribed in 4' squares.
2. Expansion joints across the sidewalk not more than 16' apart.
3. 1/2" Preformed Bituminous Expansion Joint Material in expansion joints to be 1/4" below surface of sidewalk.
4. Concrete to be Mix 2. (3000 PSI)
5. When Sidewalk abuts curb, walk shall be 1/2" above curb with 1/2" Preformed Bituminous Expansion Joint between them and resting on a compacted crushed stone base. See DETAIL "A" this sheet.
6. Off site drain to be 3" diameter plastic or fiber pipe to 1' behind walks where they are adjacent to curb.



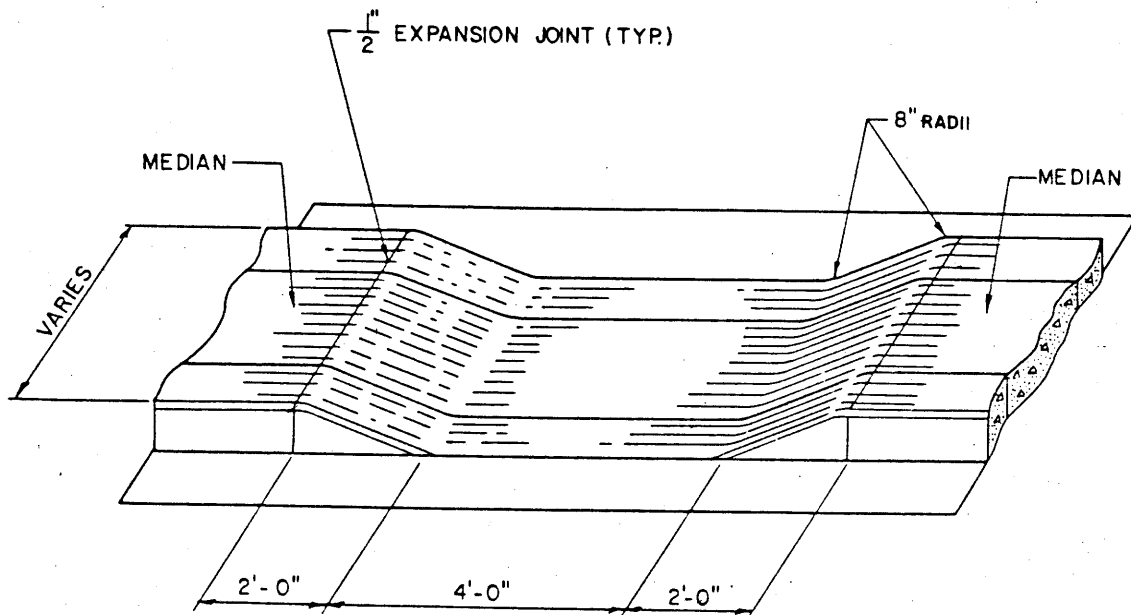
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

*W. Allen, Jr.*  
DIRECTOR, PUBLIC WORKS  
DATE *5-2-00*

*William Moore III*  
DEP. DIRECTOR, PUBLIC WORKS  
DATE *4/12/00*

STANDARD 4' SIDEWALK

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REMOVED \_\_\_\_\_  
PLATE S-9



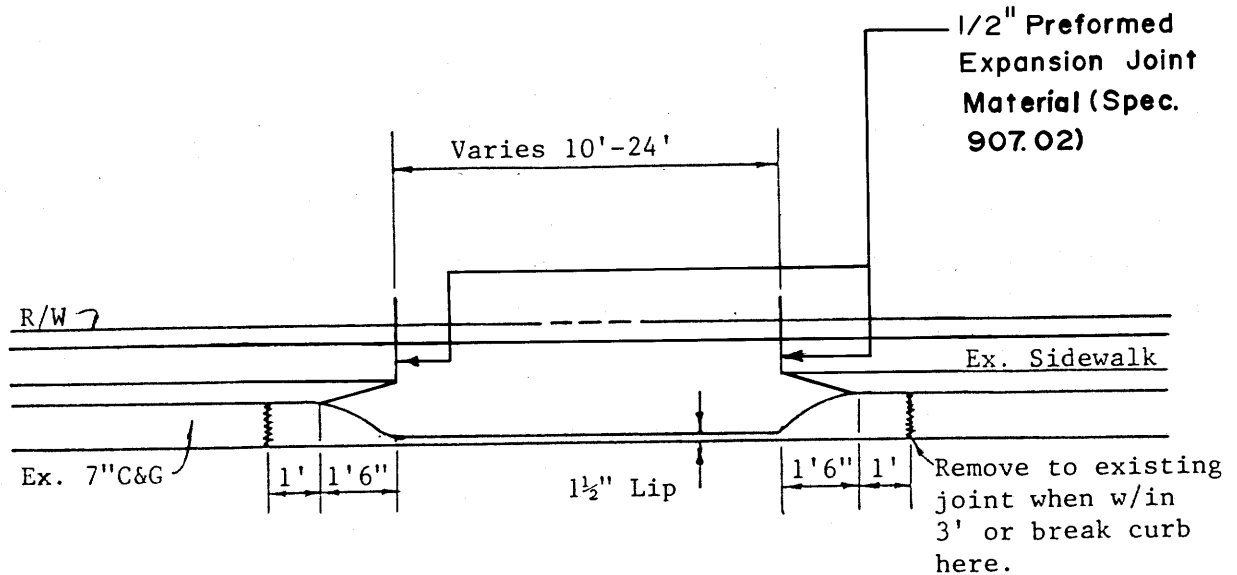
*[Signature]* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



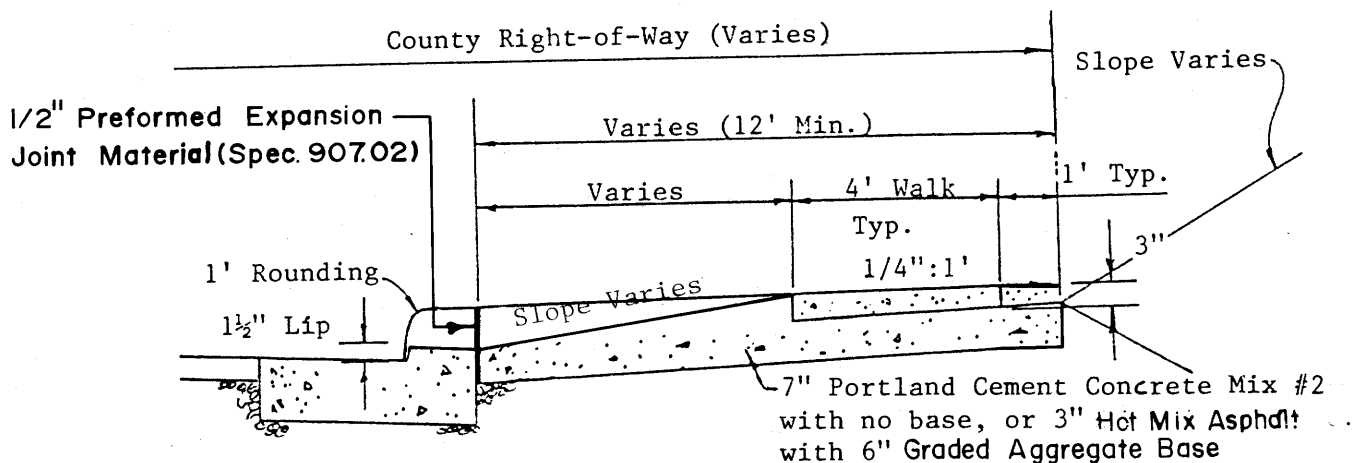
HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

MEDIAN & ISLAND  
 OPENINGS

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE S-10



### DRIVEWAY ENTRANCE



### NOTES:

### SECTION - DRIVEWAY

1. The driveway will rise on a 1"/foot max. to 1/2"/foot min. slope from the 1 1/2" lip at the edge of the road a min. distance of 12' or to the R/W line, whichever is greater. From there the driveway may slope up or down to meet existing ground conditions.
2. The driveway must be paved (Portland Cement Concrete or Hot Mix Asphalt W/ Graded Aggregate Base) from the edge of the traffic way a min. distance of 12' or to the County Right of Way line, whichever is greater.
3. No driveway will be constructed w/in 5' of the closest edge of any combination inlet.
4. Hot Mix Asphalt alternate may be used only where sidewalks are not present or on approval by the Director.

*John A. Adams, Jr.*  
Director of Public Works

5-2-00  
Date

*W. Hocking Moore, Jr.*  
DEP. DIRECTOR, PUBLIC WORKS

4/12/00  
Date



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

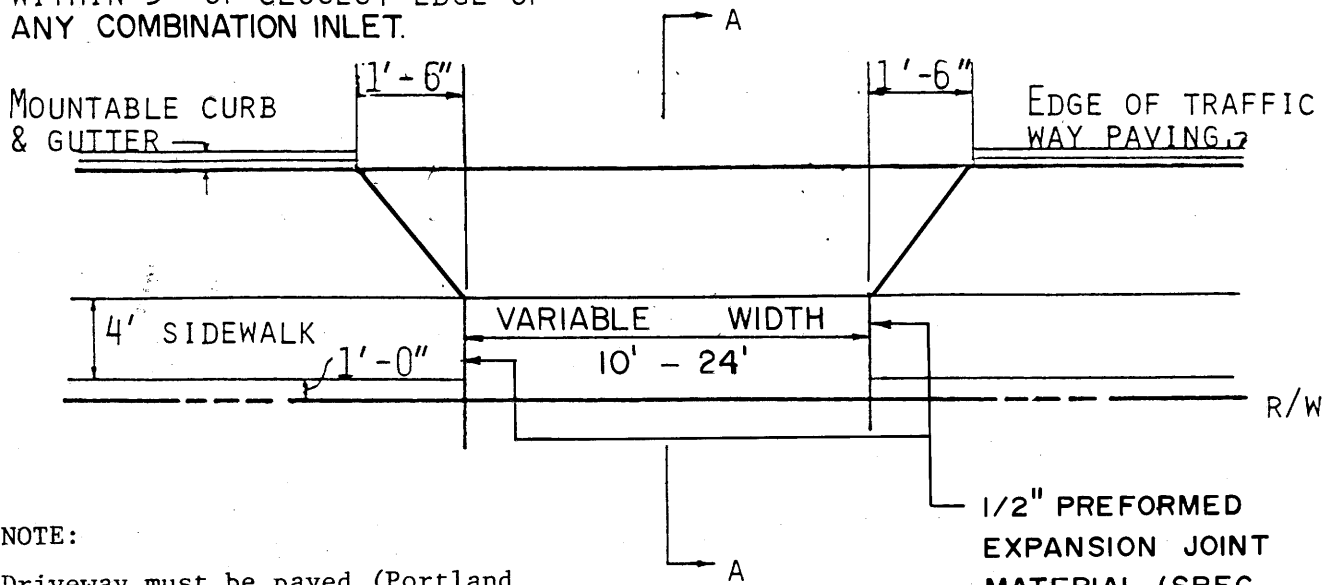
TYPICAL DRIVEWAY ENTRANCE  
FOR 7" CONCRETE CURB AND  
GUTTER WITH SIDEWALK

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-II



**NOTE:**

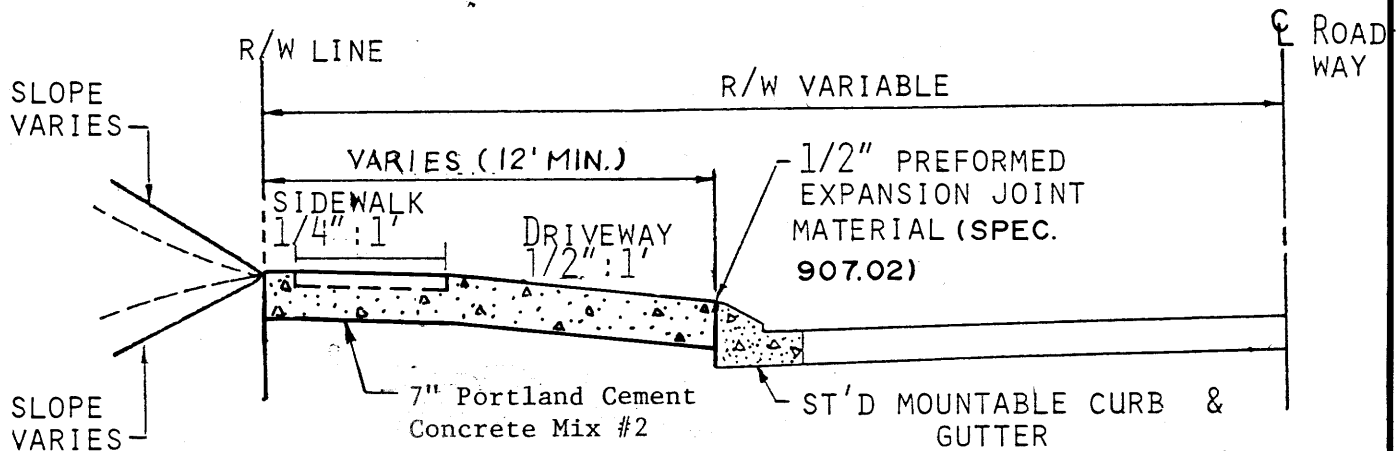
NO DRIVEWAY SHALL BE CONSTRUCTED  
WITHIN 5' OF CLOSEST EDGE OF  
ANY COMBINATION INLET.



**NOTE:**

Driveway must be paved (Portland  
Cement Concrete Mix #2, or where  
no sidewalks are present, Hot Mix  
Asphalt) from edge of traffic way  
a minimum distance of 12', or to the  
County Right of Way Line, whichever  
is the greater.

**PLAN**



**\*NOTE:**

Alternate Minimum:  
3" Hot Mix Asphalt W/ 6" Graded Aggregate  
Base. Alternate may be used Only  
where sidewalks are not present or on  
approval by the Director.

**SECTION A-A**

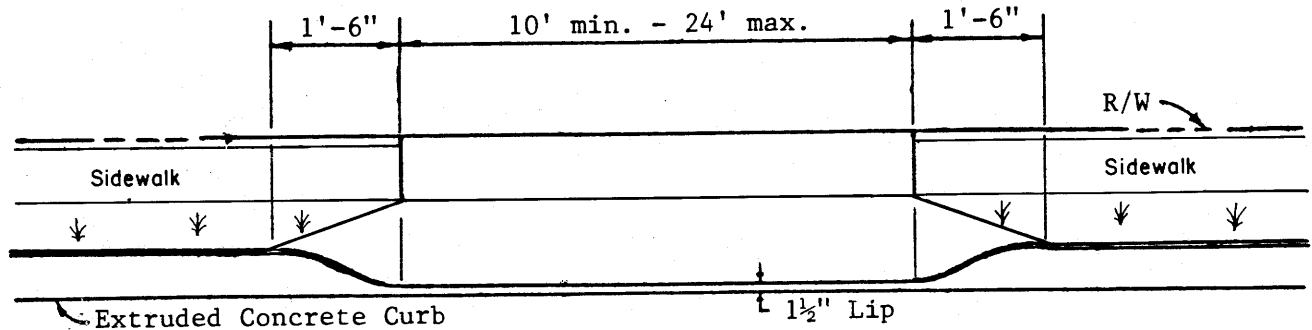
*John A. ...* 5200  
DIRECTOR OF PUBLIC WORKS DATE  
*J. ...* 9/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



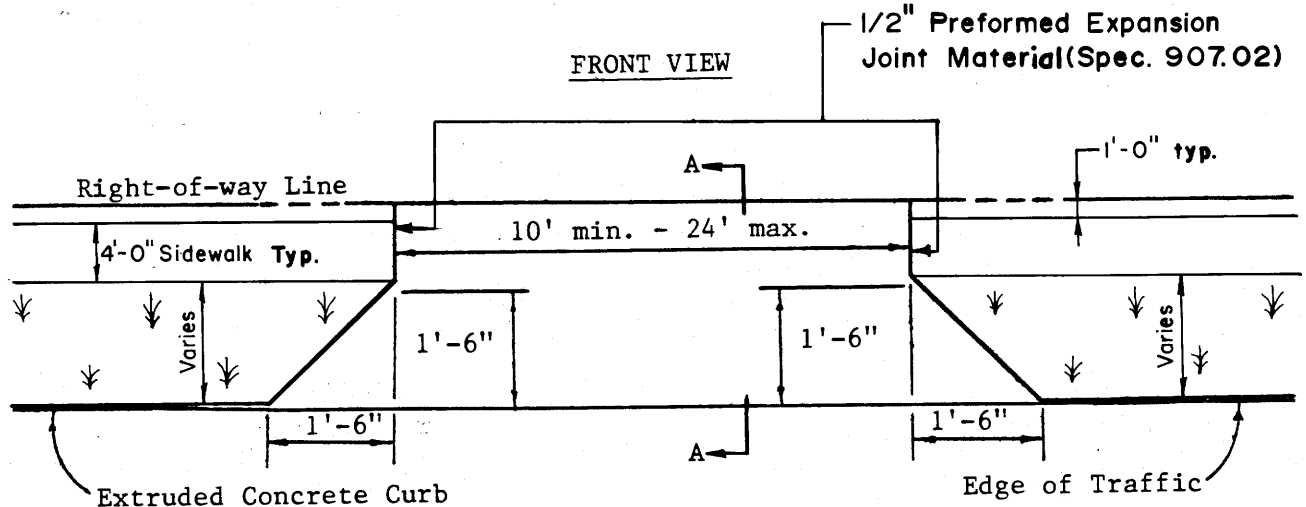
**HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS**

**TYPICAL DRIVEWAY ENTRANCE  
DETAIL FOR MOUNTABLE CURB  
AND GUTTER**

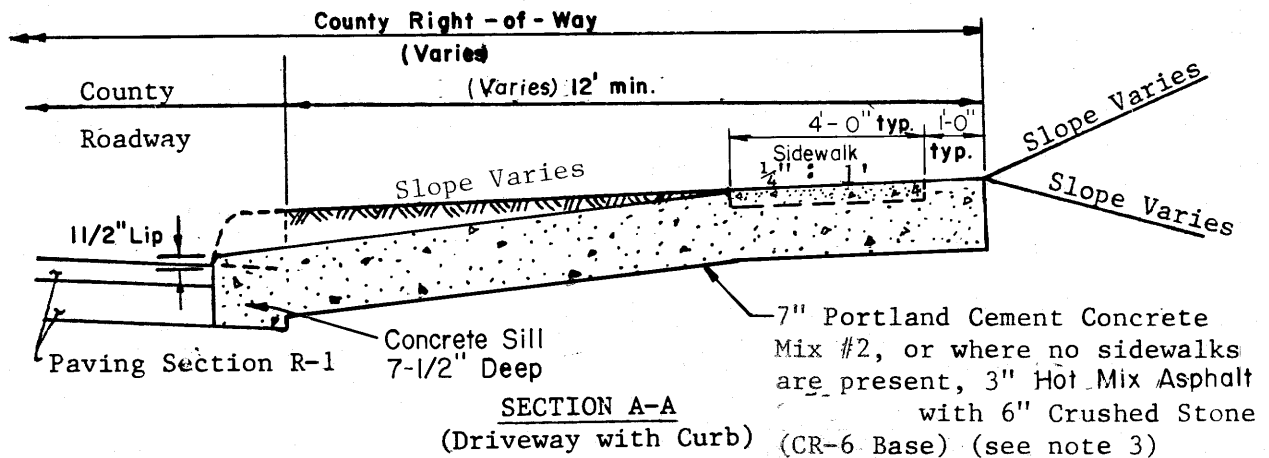
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
**PLATE S-12**



FRONT VIEW



PLAN



Notes:

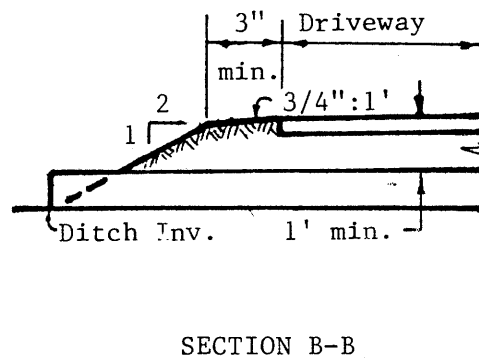
1. Driveway will rise on a 1"/ft. maximum to 1/2"/ft. minimum slope from the 1 1/2" lip a minimum distance of 12 feet or to the county right-of-way line, whichever is greater. From there, the driveway may slope up or down to meet existing ground conditions.
2. No driveway shall be constructed within 5 feet of the closest edge of an existing or proposed combination inlet.
3. Hot Mix Asphalt alternate to be used only where sidewalks are not present or on approval by the Director.



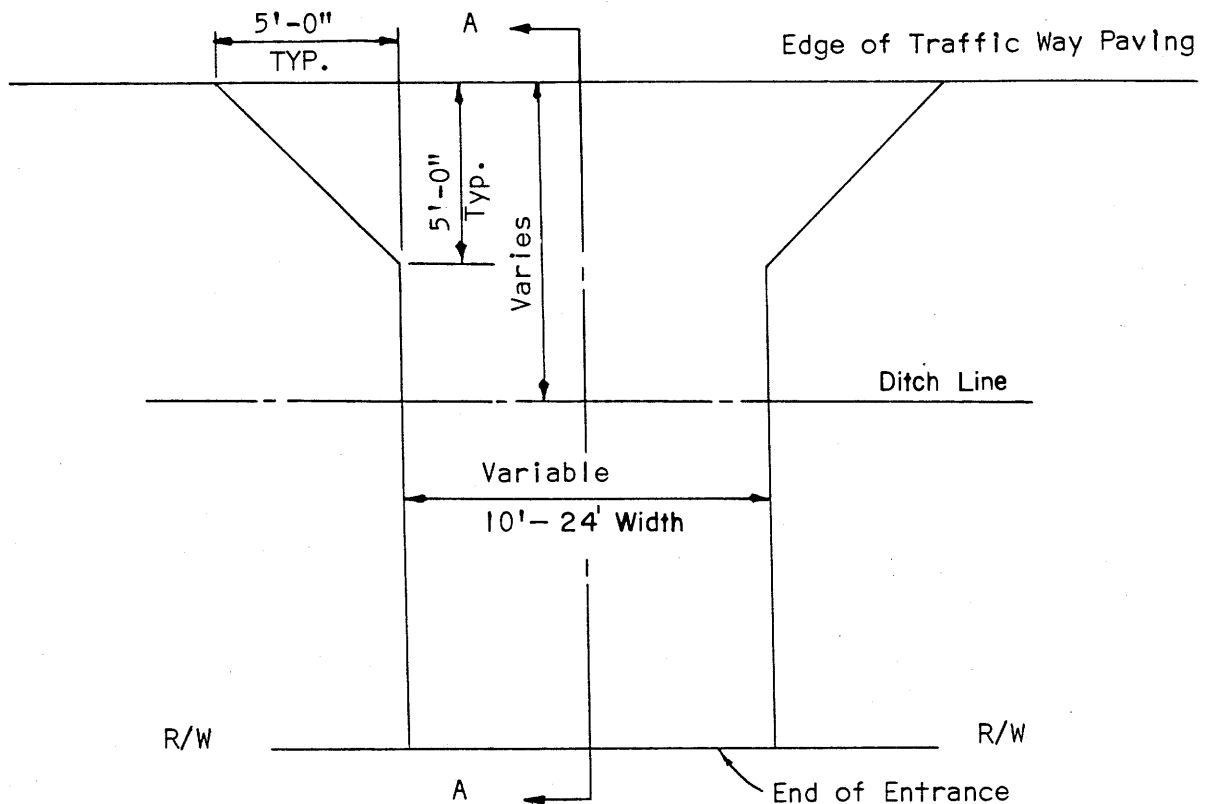
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

TYPICAL DRIVEWAY  
ENTRANCE FOR EXTRUDED  
CURBED STREET W/SIDEWALK

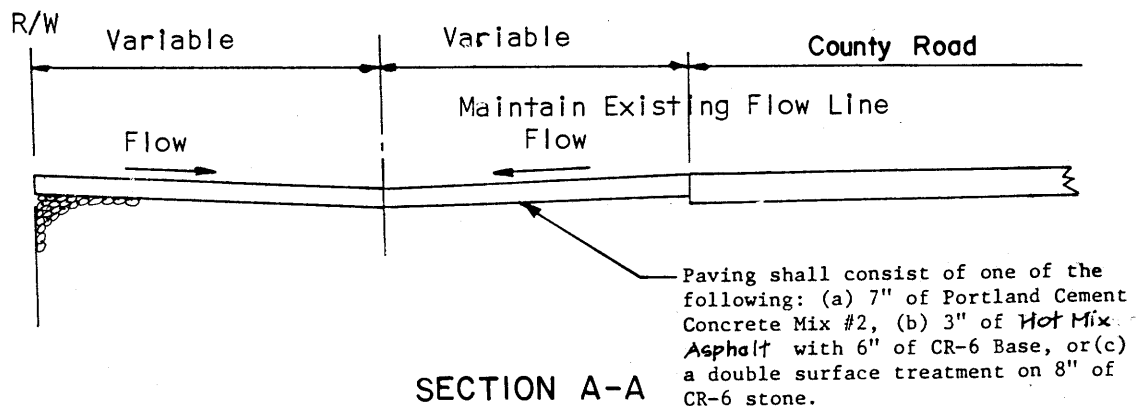
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-13



ISSUED \_\_\_\_\_  
 REVISED: \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE S-14



PLAN



SECTION A-A

NOTE: Driveway must be paved (Surface treatment, Hot Mix Asphalt or Portland Cement Concrete) from edge of traffic way a minimum distance of 12' or to the County Right of Way line, whichever is the greater.

*Phil Adams* 52-00  
DIRECTOR OF PUBLIC WORKS DATE  
*William Mayo III* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE

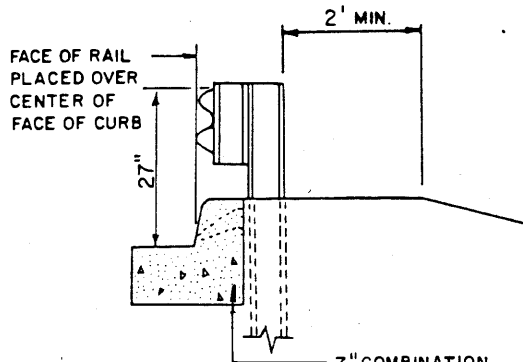


**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

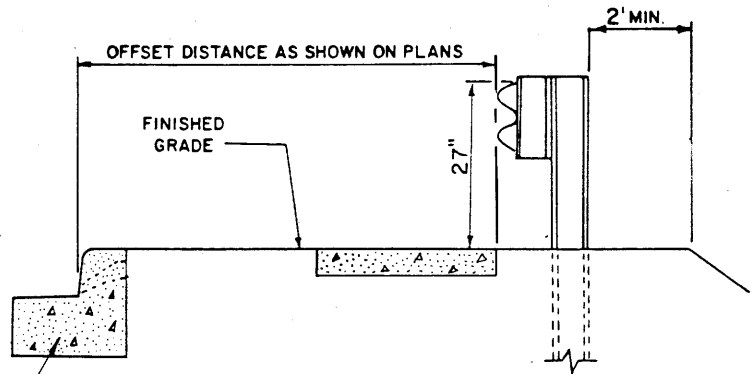
**TYPICAL DRIVEWAY ENTRANCE**  
**OPEN SECTION ROAD**  
**( DRAIN PIPE NOT REQUIRED)**

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-15

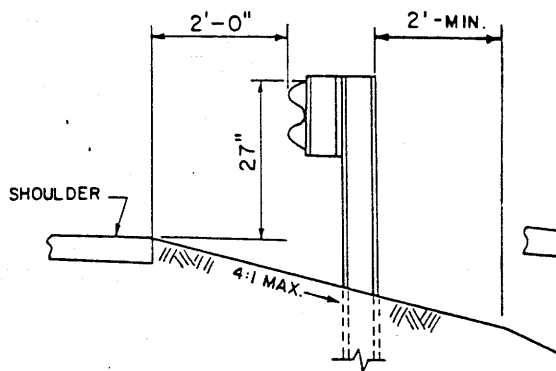
*W. Adams* 5-200  
 DIRECTOR OF PUBLIC WORKS DATE  
*W. Adams* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



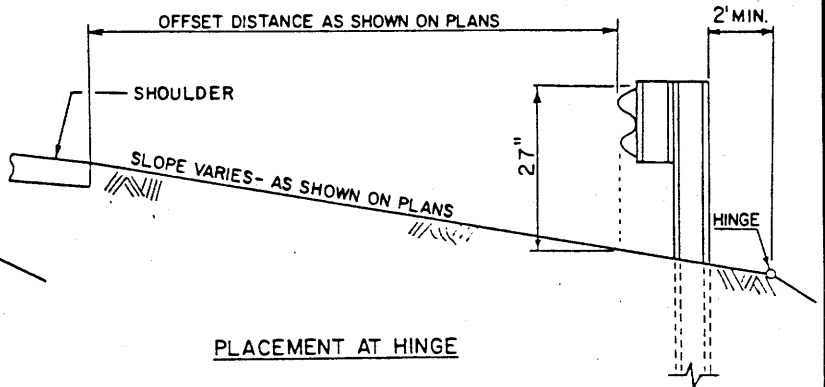
PLACEMENT AT CURBS  
 (WITHOUT SIDEWALKS)



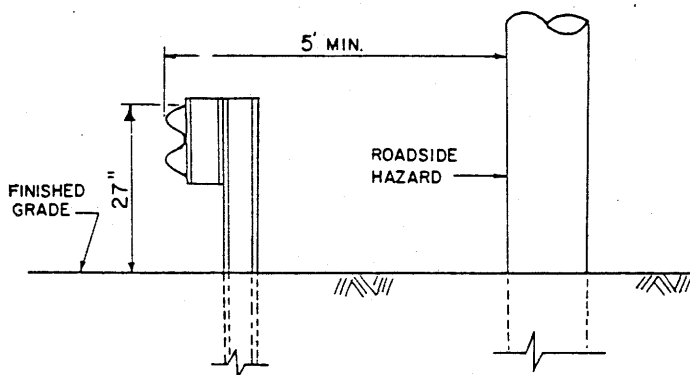
PLACEMENT BEHIND SIDEWALK AREA



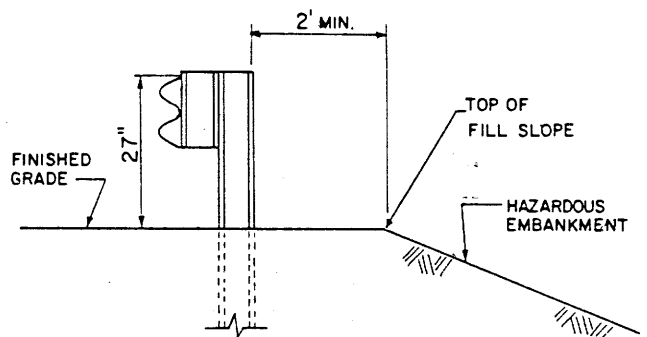
PLACEMENT AT EDGE OF SHOULDER



PLACEMENT AT HINGE



MINIMUM OFFSET TO HAZARD



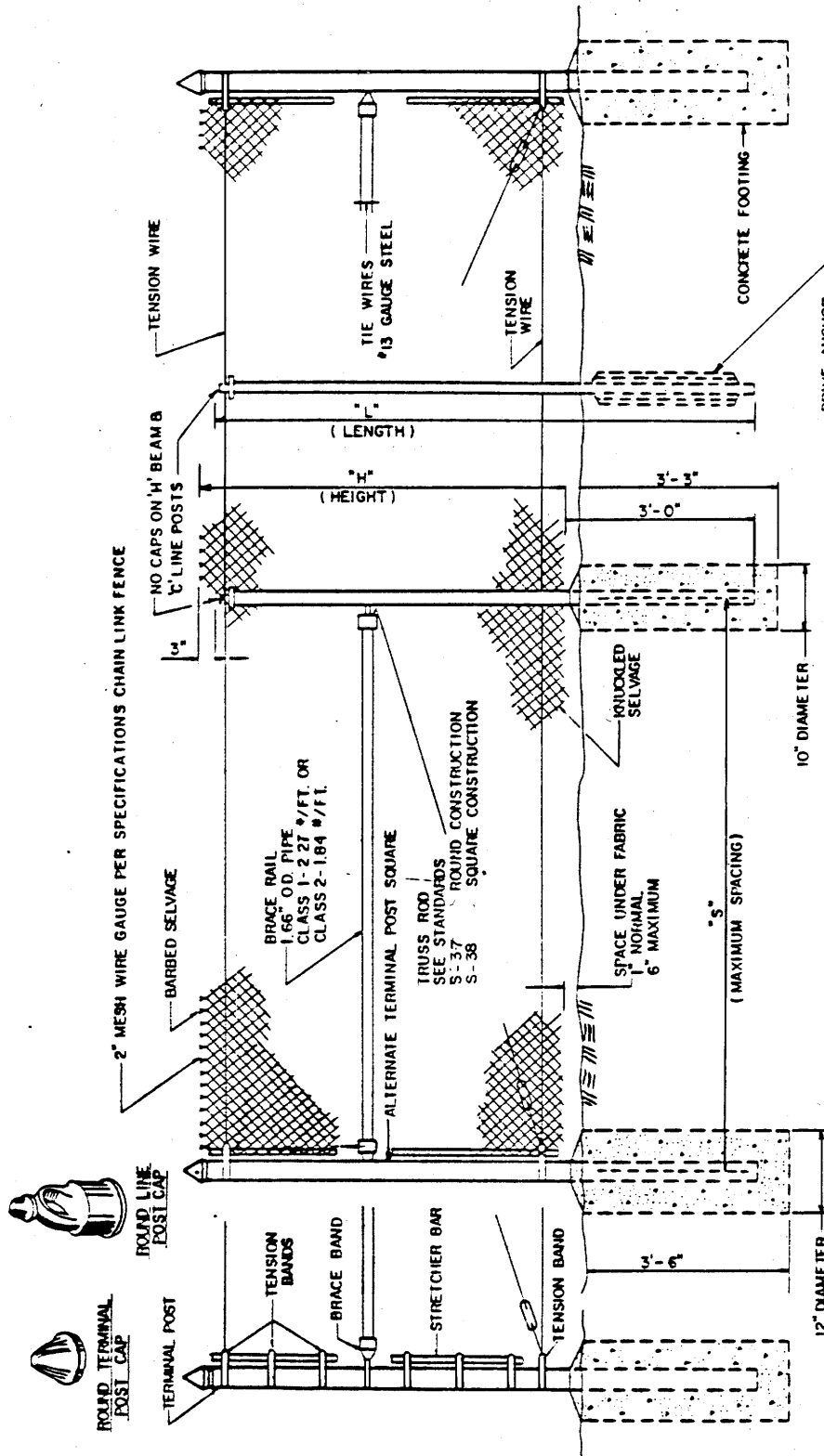
MINIMUM OFFSET TO SLOPE



**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**GUARD RAIL WITH BEAM**  
**PLACEMENT DETAILS**

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE S-16



DRIVE ANCHOR  
SQUARE OR ROUND TERMINAL POST CONSTRUCTION  
ALTERNATE TO CONCRETE FOOTING  
SEE DETAIL STANDARD

#### NOTES:

- ALL ROUND LINE POSTS TO BE CAPPED WITH LOOP CAPS. TENSION WIRE TO RUN THROUGH LOOP CAPS TO BE FASTENED TO ALL TERMINAL POSTS WITH TENSION BANDS.
- FASTEN FABRIC TO TENSION WIRE WITH HOG RINGS @ 18\"/>

LINE POSTS	5'-0\"/>
------------	----------

*Ed Allen* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*D. Winkler* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE

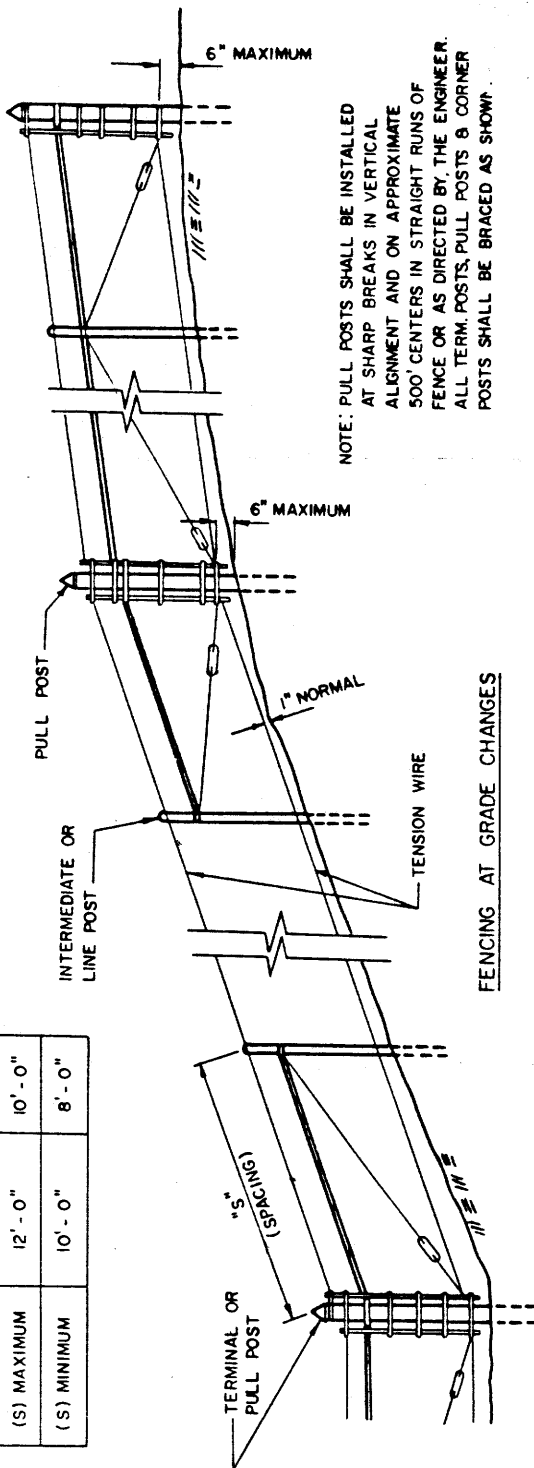


HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

CHAIN LINK FENCE  
TYPICAL 5 FT. RURAL 6 FT.  
AND 8 FT.

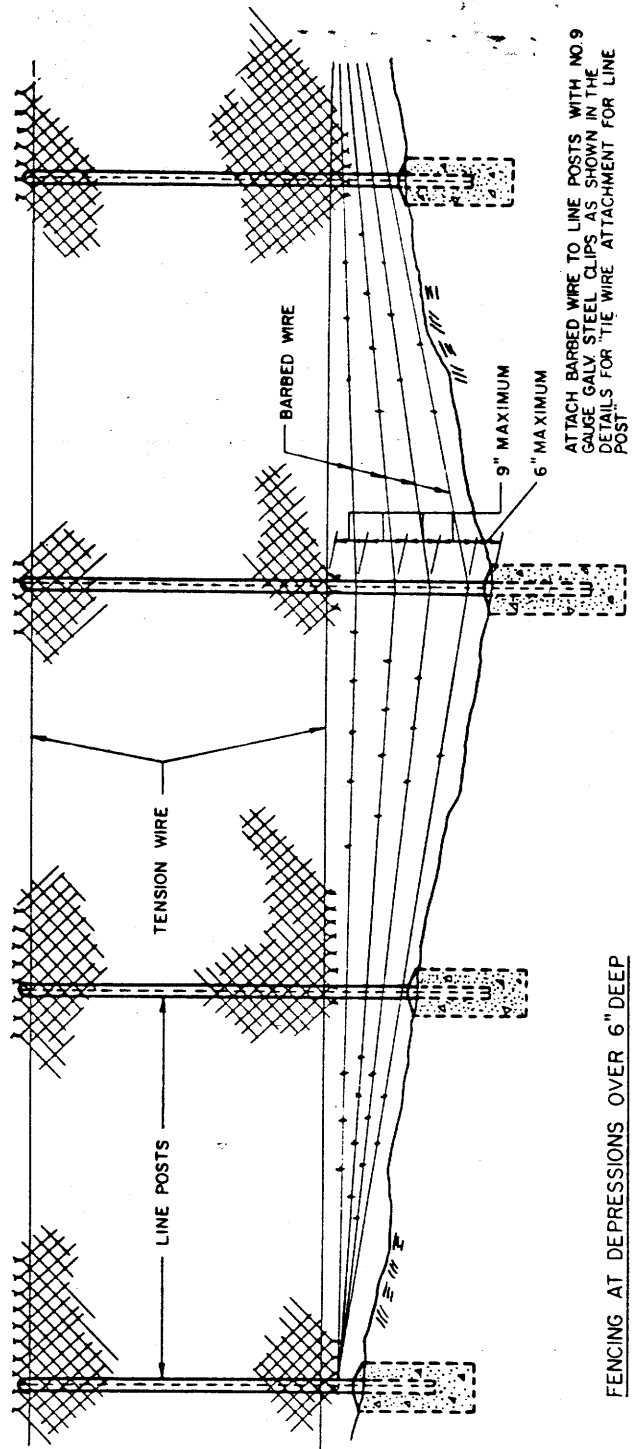
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-17

	5' - 0" RURAL	6' - 0"
(S) MAXIMUM	12' - 0"	10' - 0"
(S) MINIMUM	10' - 0"	8' - 0"



NOTE: PULL POSTS SHALL BE INSTALLED AT SHARP BREAKS IN VERTICAL ALIGNMENT AND ON APPROXIMATE 500' CENTERS IN STRAIGHT RUNS OF FENCE OR AS DIRECTED BY THE ENGINEER. ALL TERM. POSTS, PULL POSTS & CORNER POSTS SHALL BE BRACED AS SHOWN.

#### FENCING AT GRADE CHANGES



#### FENCING AT DEPRESSIONS OVER 6" DEEP

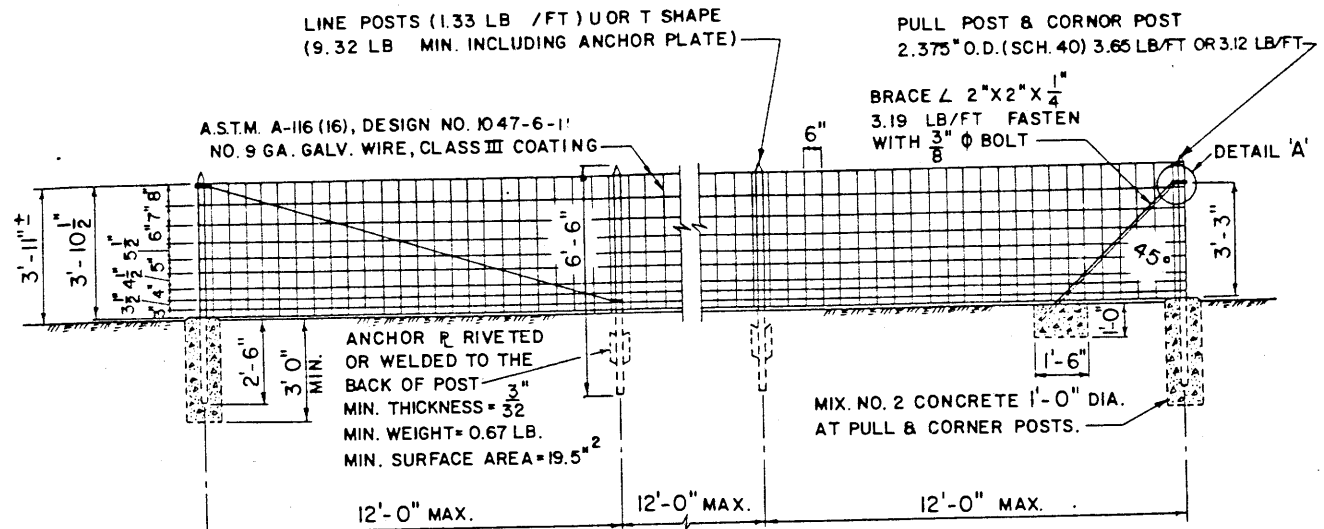


HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

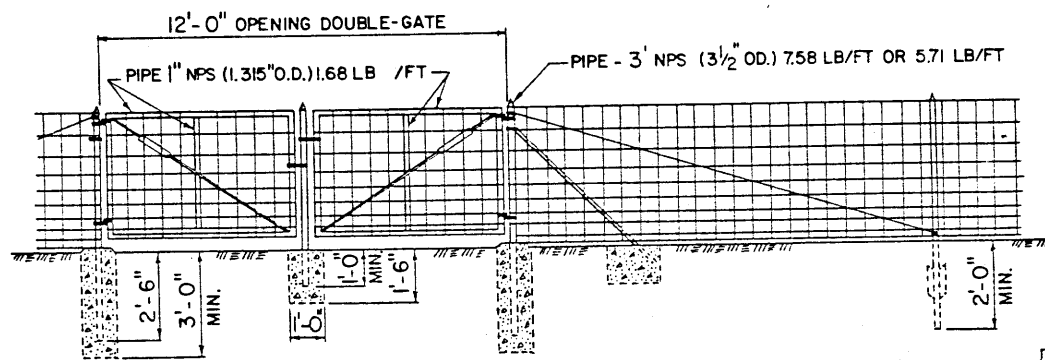
### CHAIN LINK FENCE AT GRADE CHANGES AND DEPRESSIONS

*Philip Adams* 5-22-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. N. Nixson* 4/14/00  
DEP. DIRECTOR, PUBLIC WORKS DATE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-18

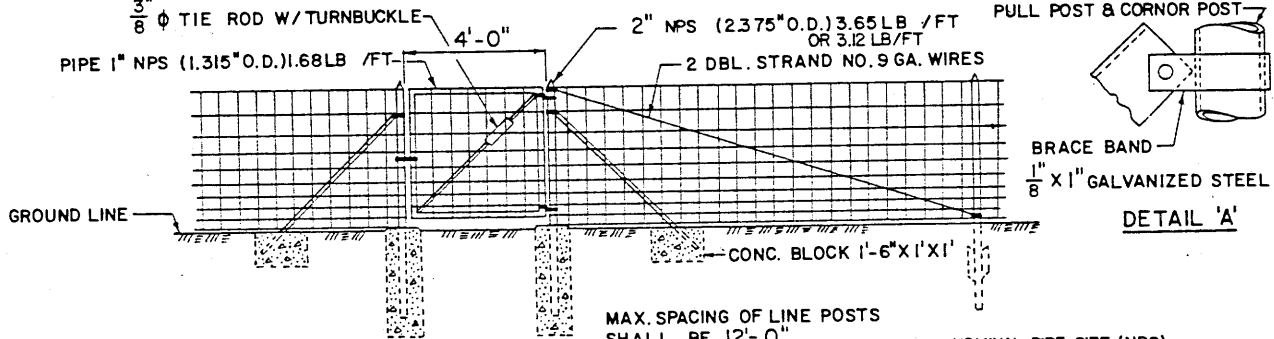


GENERAL DETAILS



GRATE FRAMES & POSTS SHALL BE OF A.S.T.M. A-120 HOT DIPPED GALV. PIPE.

DOUBLE SWING GATE



SINGLE GATE

NOTES:

POSTS IN ROCK - WHERE SUBSTANTIAL ROCK IS ENCOUNTERED A HOLE ONE (1") INCH LARGER IN DIAMETER THAN THE POST AND OF 12" MINIMUM DEPTH FOR LINE POSTS AN 18" MINIMUM DEPTH FOR TERMINAL POSTS, SHALL BE MADE AFTER INSERTING THE POSTS, THE HOLES SHALL BE BACKFILLED WITH A HANDMIXED 1:2 MORTAR CONSISTING OF ONE PART PORTLAND CEMENT AND TWO PARTS FINE AGGREGATES MIXED TO A PLASTIC CONSISTENCY SHOWING NO SIGNS OF FREE WATER. THE HANDMIXING AND CONSOLIDATION OF THE MORTAR SHALL BE PERFORMED IN A MANNER APPROVED BY THE ENGINEER.

THE WEIGHT OF STEEL PIPE CALLED FOR ON THIS STANDARD SHALL NOT VARY MORE THAN - 5% FROM THE INDICATED WEIGHT, BUT MAY EXCEED SUCH INDICATED WEIGHT. THE WEIGHT OF STEEL SHAPES CALLED FOR ON THIS STANDARD SHALL NOT VARY MORE THAN - 2.5% FROM THE INDICATED WEIGHT, BUT MAY EXCEED SUCH INDICATED WEIGHT.

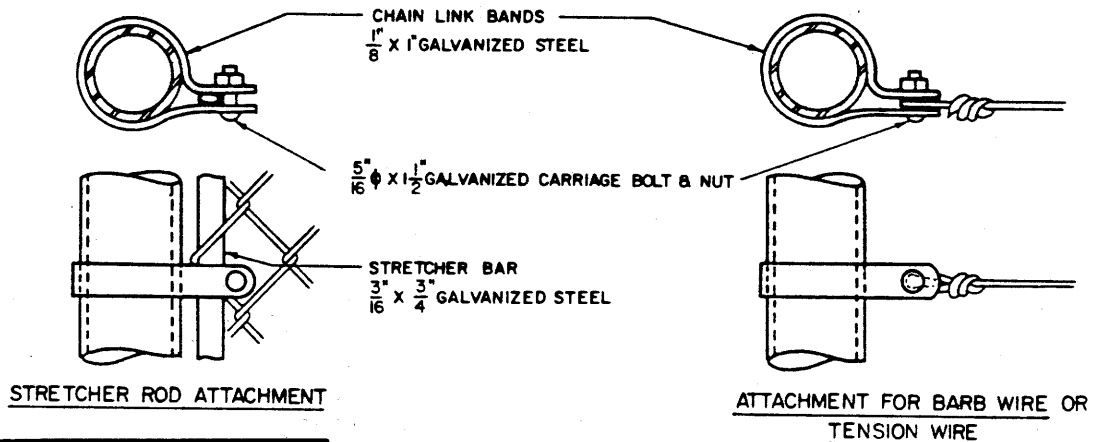
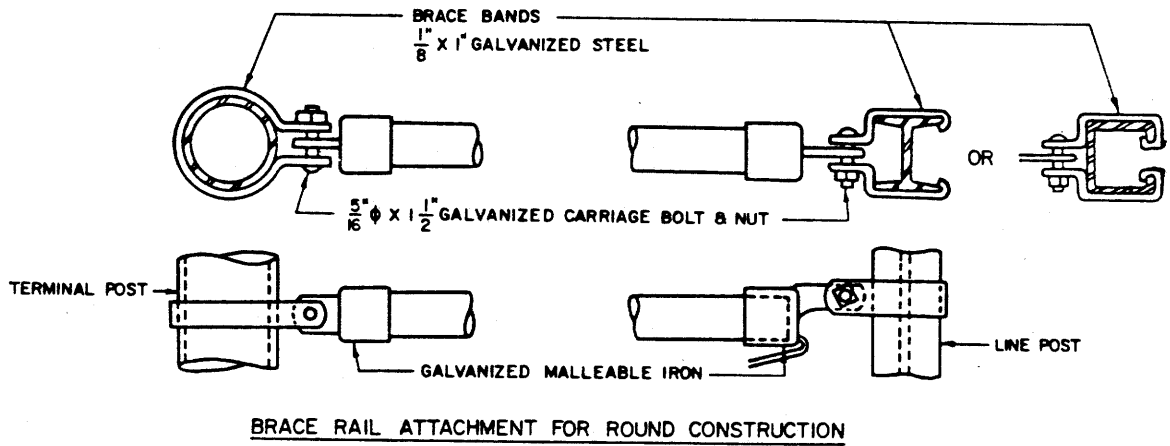
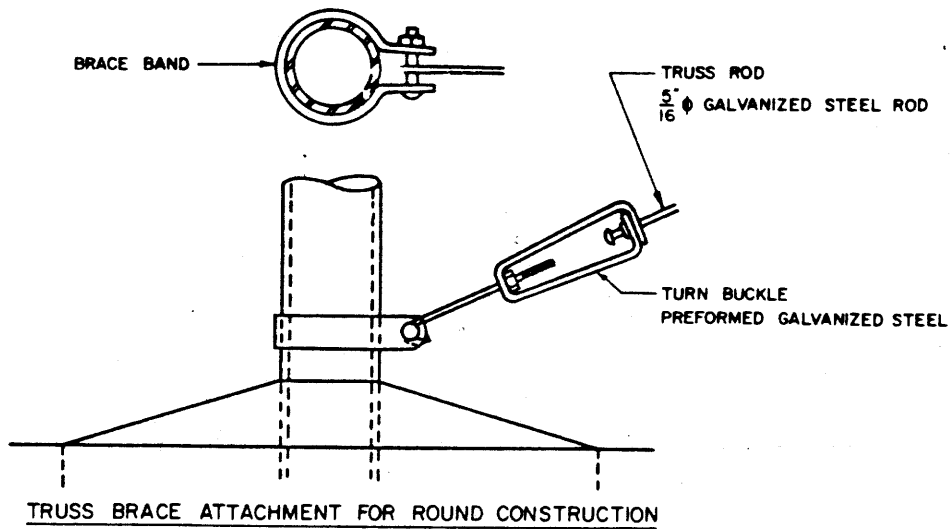


HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

4'-0" FARM TYPE FENCE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-19





*ALL ALLEN to 5-20*  
DIRECTOR OF PUBLIC WORKS DATE  
*W. W. Myers, Jr.*  
DEP. DIRECTOR, PUBLIC WORKS DATE

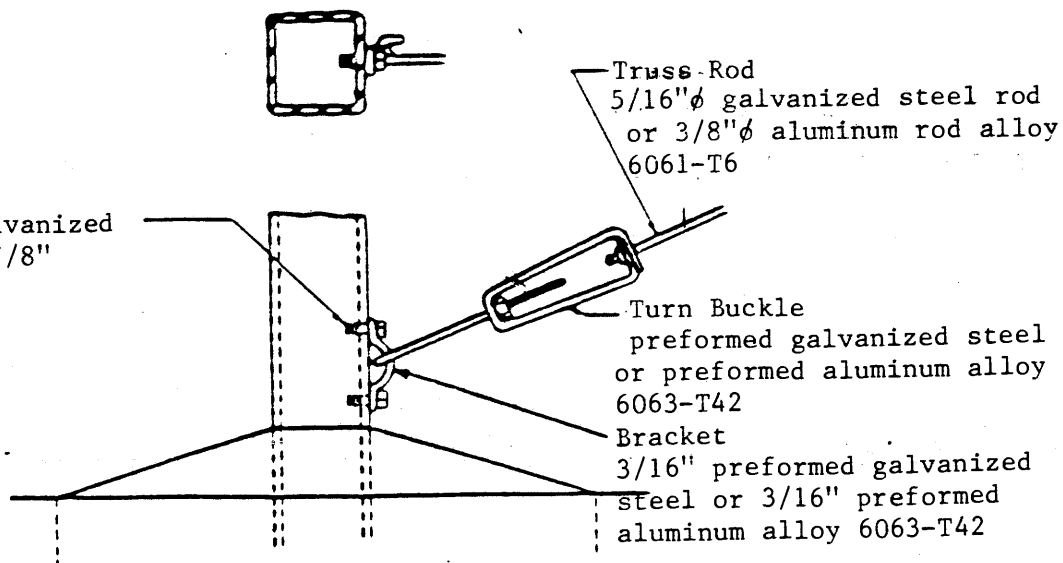


HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

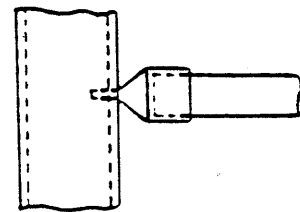
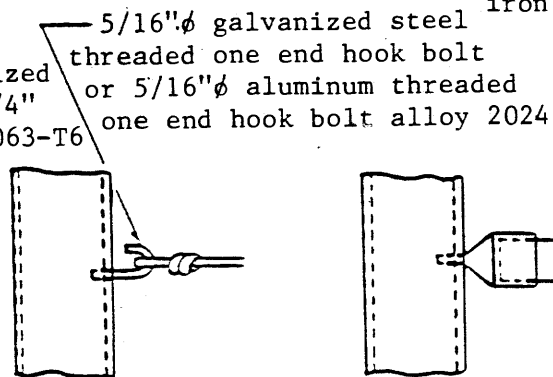
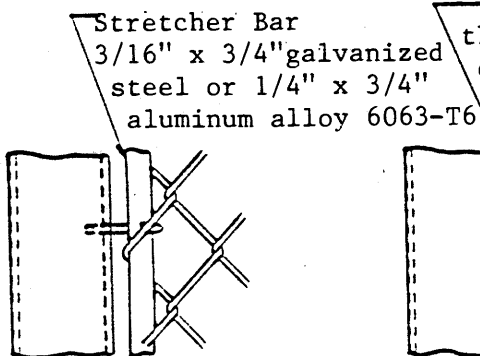
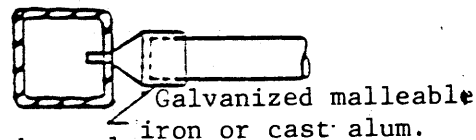
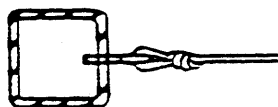
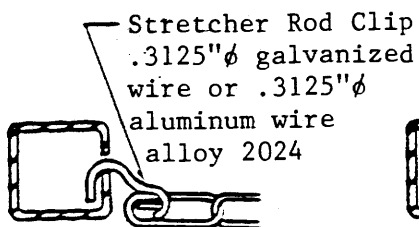
CHAIN LINK FENCE  
BRACE & ROD ATTACHMENTS-  
ROUND CONSTRUCTION

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-20

5/16"  $\phi$  x 7/8" galvanized  
bolt or 5/8"  $\phi$  x 7/8"  
aluminum bolt



ALTERNATE TRUSS BRACE ATTACHMENT FOR SQUARE CONSTRUCTION



ALTERNATE STRETCHER  
ROD ATTACHMENT

ALTERNATE ATTACHMENT  
FOR BARB WIRE  
OR  
TENSION WIRE

ALTERNATE BRACE RAIL ATTACHMENT  
FOR SQUARE CONSTRUCTION

*John A. Allen* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*William M. Myers* 4-12-00  
DEP. DIRECTOR, PUBLIC WORKS DATE

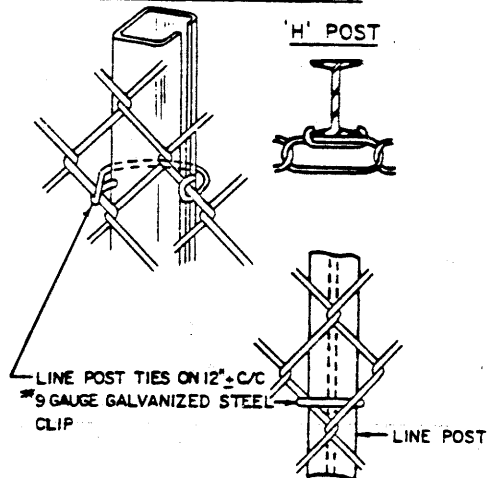


HARFORD COUNTY, MD.  
DEPARTMENT OF  
PUBLIC WORKS

CHAIN LINK FENCE  
BRACE & ROD ATTACHMENTS -  
SQUARE CONSTRUCTION

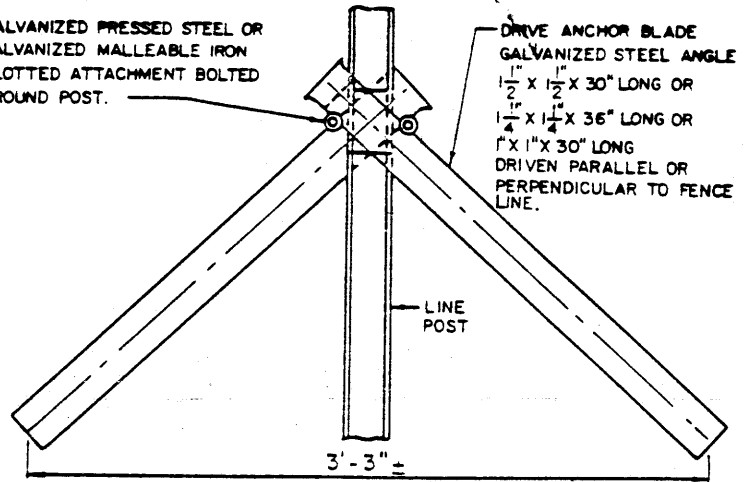
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-21

'C' POST OR 'ROUND' POST

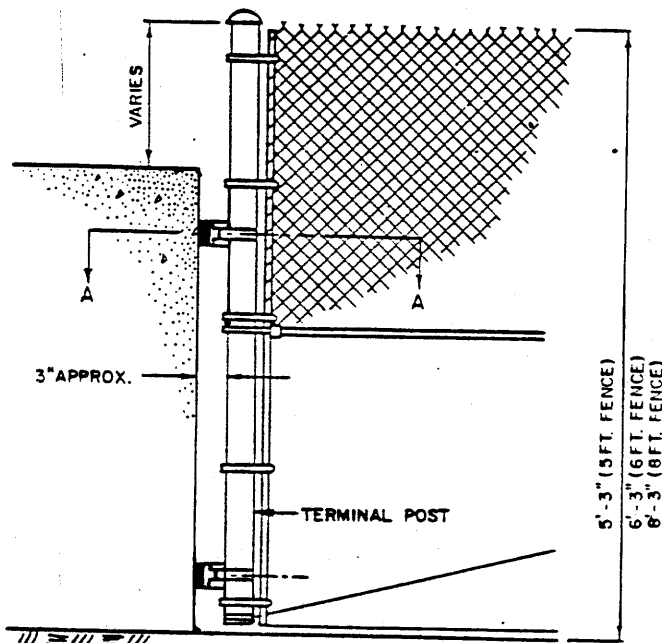


TIE WIRE ATTACHMENT  
FOR LINE POST

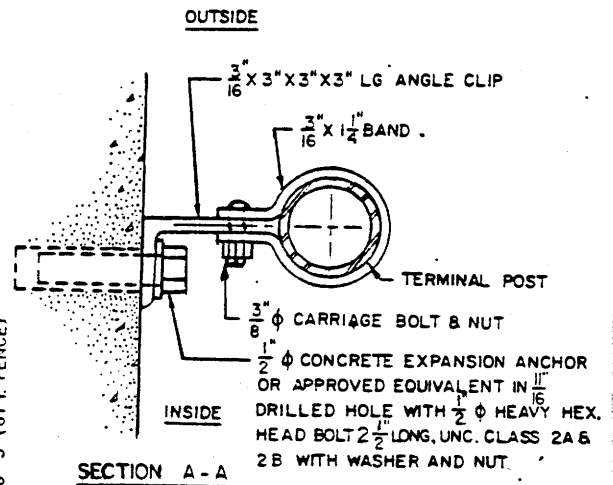
GALVANIZED PRESSED STEEL OR  
GALVANIZED MALLEABLE IRON  
SLOTTED ATTACHMENT BOLTED  
AROUND POST.



DRIVE ANCHOR FOR LINE POST  
ALTERNATE TO CONCRETE FOOTING



ALTERNATE POST ATTACHMENT AT BRIDGE END



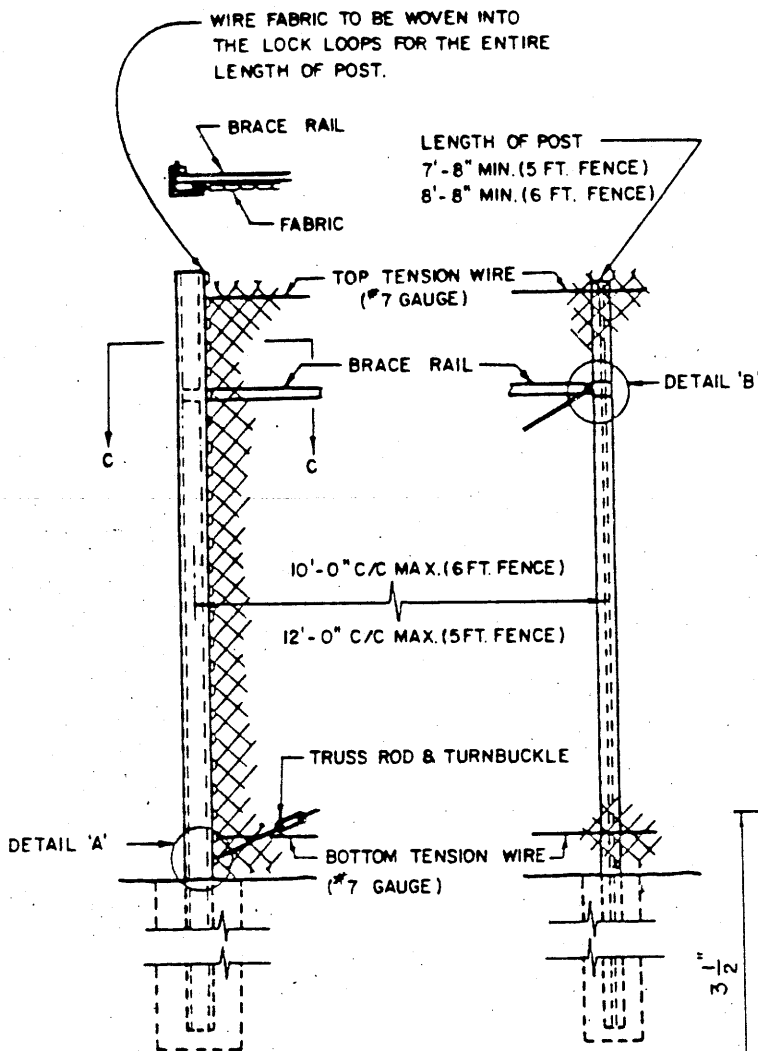
*L. J. Weber* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*L. J. Weber* 4/2/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



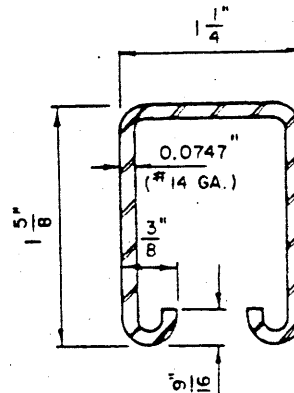
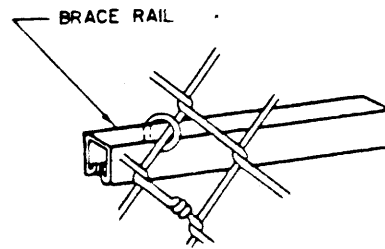
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

CHAIN LINK FENCE  
DRIVE ANCHOR & POST  
ATTACHMENT AT BRIDGE

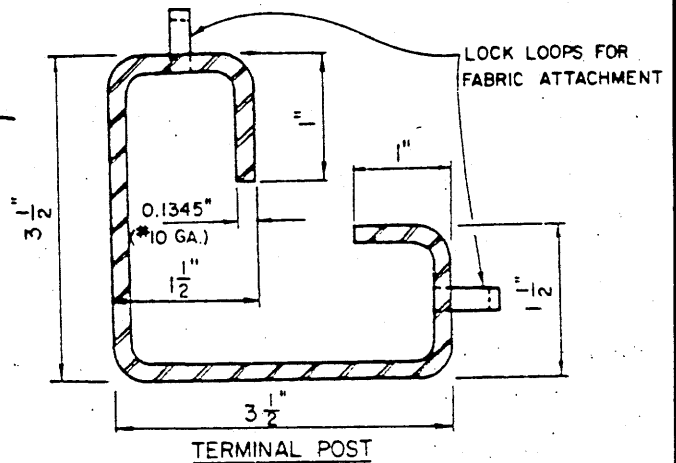
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-22



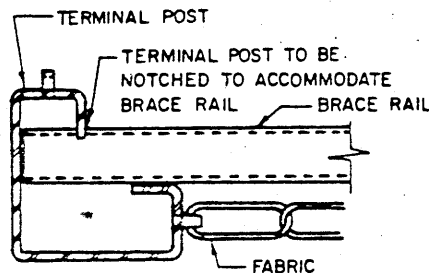
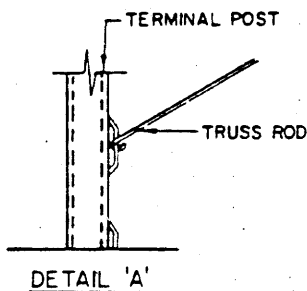
ELEVATION



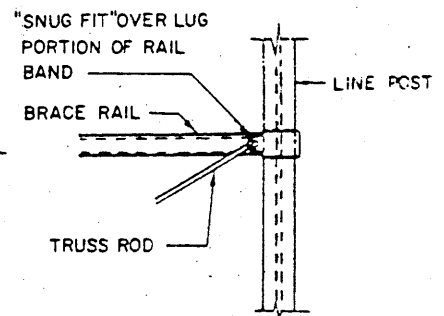
BRACE RAIL



TERMINAL POST



SECTION C - C



DETAIL 'B'

*William F. 52-0*  
DIRECTOR OF PUBLIC WORKS DATE

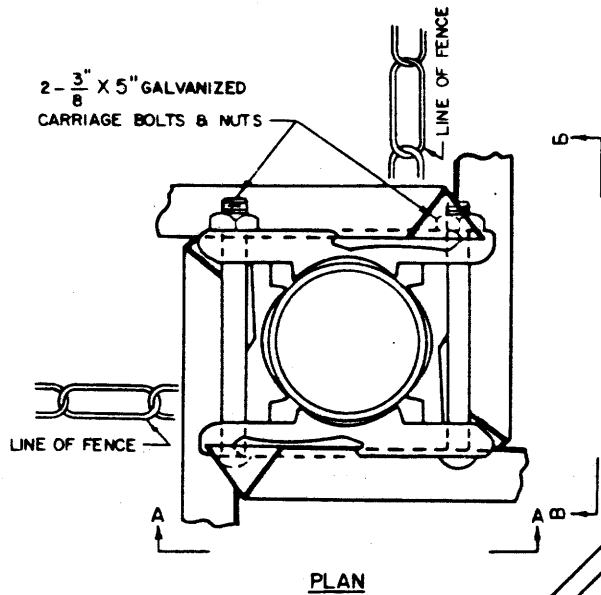
*W. Henry Moore III 4/12/00*  
DEP. DIRECTOR, PUBLIC WORKS DATE



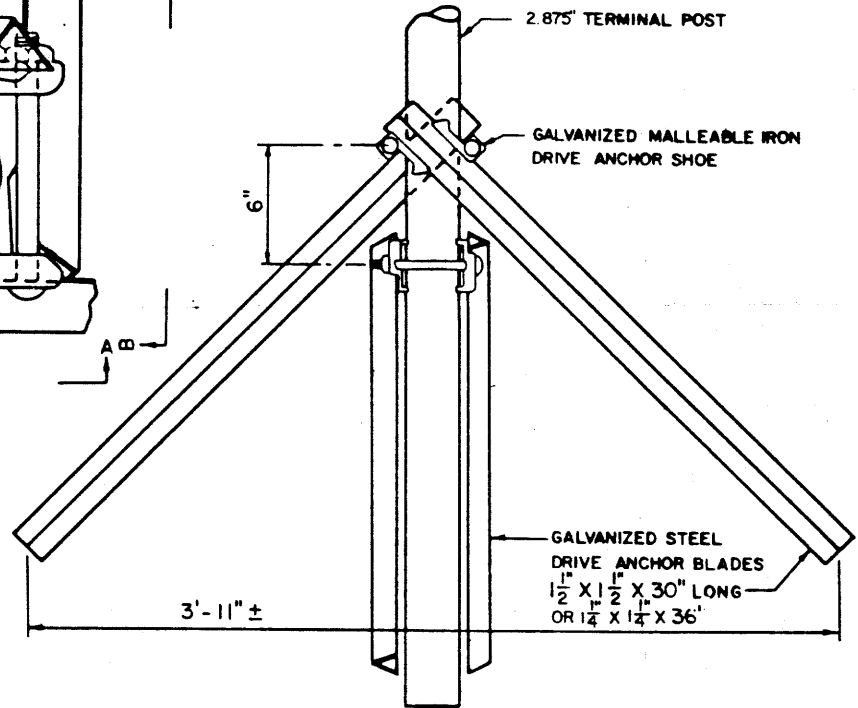
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

CHAIN LINK FENCE  
ALTERNATE TERMINAL POST

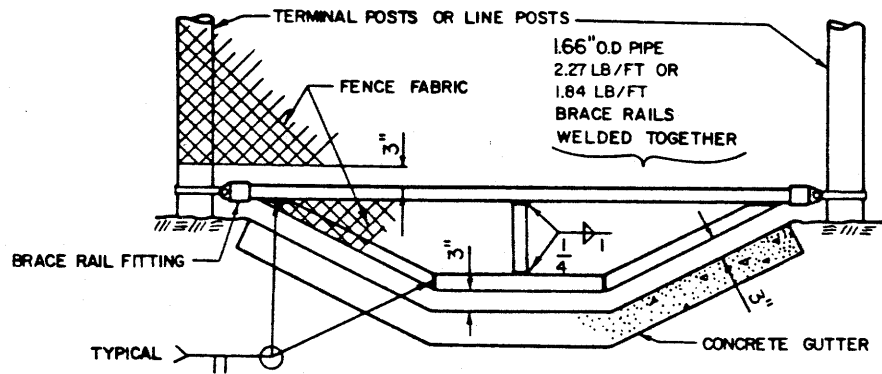
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-23



NOTE: DOUBLE DRIVE ANCHOR  
TO BE USED AT ALL TERMINAL POSTS.



SECTION A-A & SECTION B-B SIMILAR  
ELEVATION



FENCE TREATMENT AT CONCRETE DITCHES

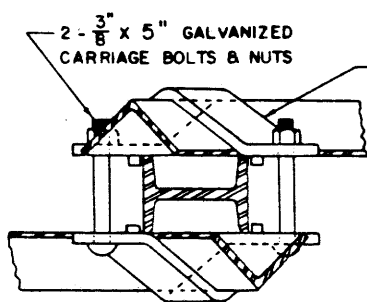
*L. R. Allen* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*William W. Moore, Jr.* 2/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



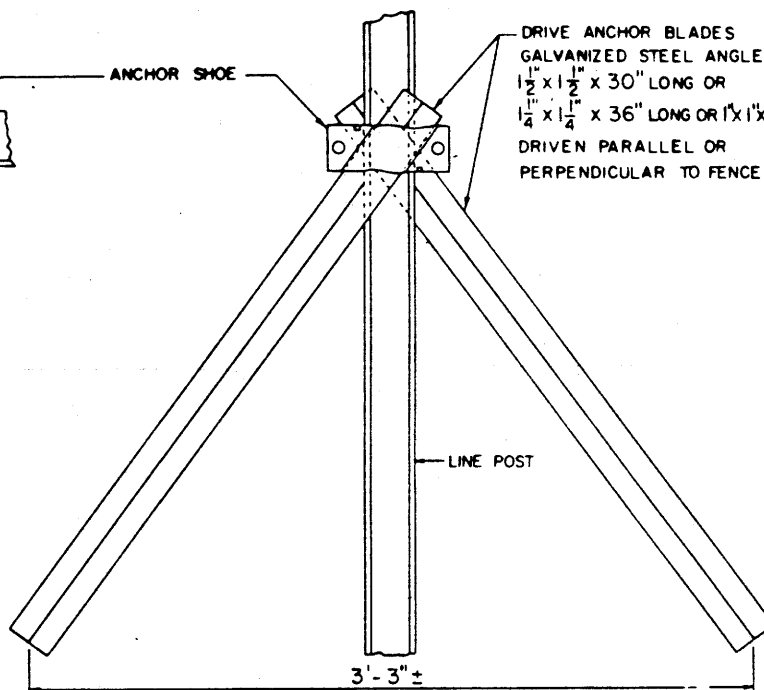
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

CHAIN LINK FENCE  
DOUBLE DRIVE ANCHOR  
AND DITCH TREATMENT

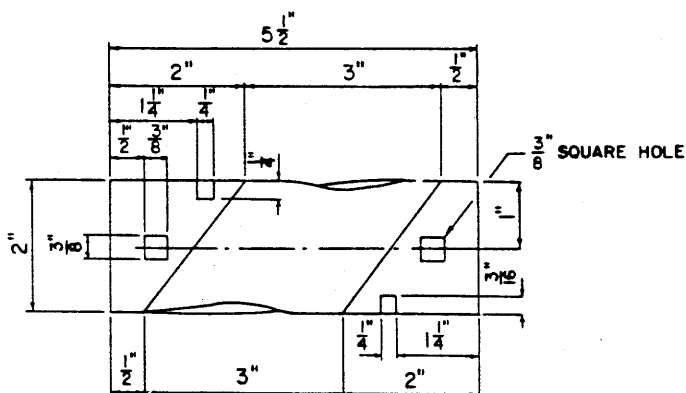
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-24



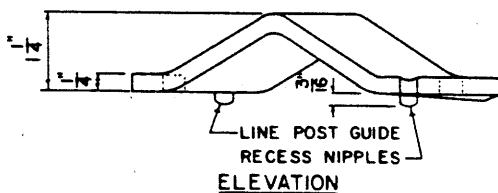
H-BEAM  
PLAN



ELEVATION

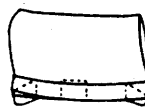


PLAN



ELEVATION

ANCHOR SHOE DETAILS



END ELEVATION

NOTE: THIS SHOE ASSEMBLY MAY  
BE USED IN PLACE OF THE  
ASSEMBLY SHOWN ON  
STANDARD PLATE 'S-22

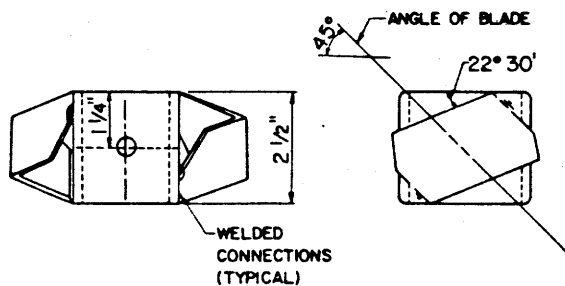
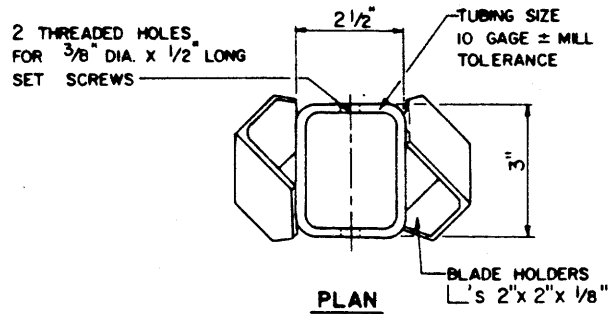
*Bill Calvert* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. Hickory Myers II* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

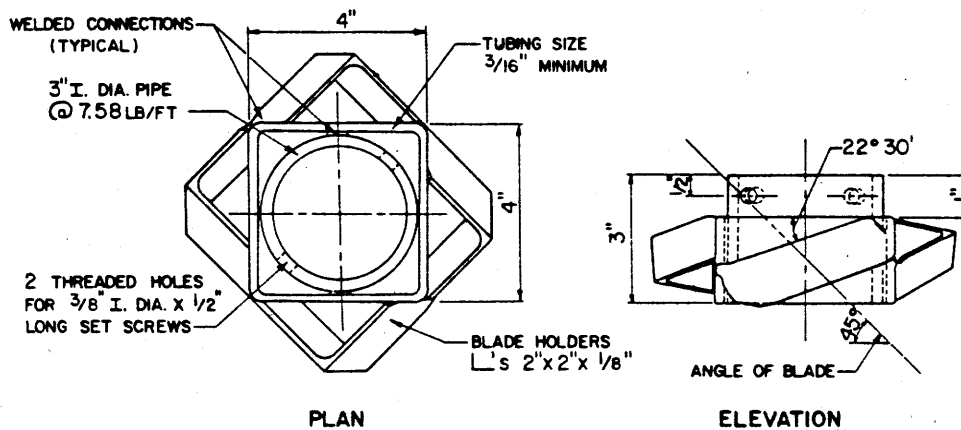
CHAIN LINK FENCE  
DRIVE ANCHOR SHOE ASSEMBLY

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-25



ELEVATION SIDE VIEW

DRIVE ANCHOR ADAPTER FOR LINE POSTS



DRIVE ANCHOR ADAPTER FOR TERMINAL POSTS

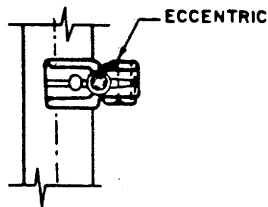
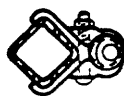
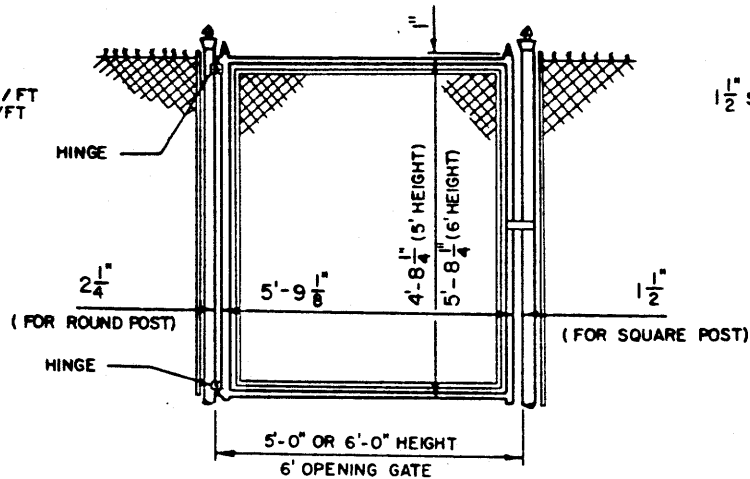
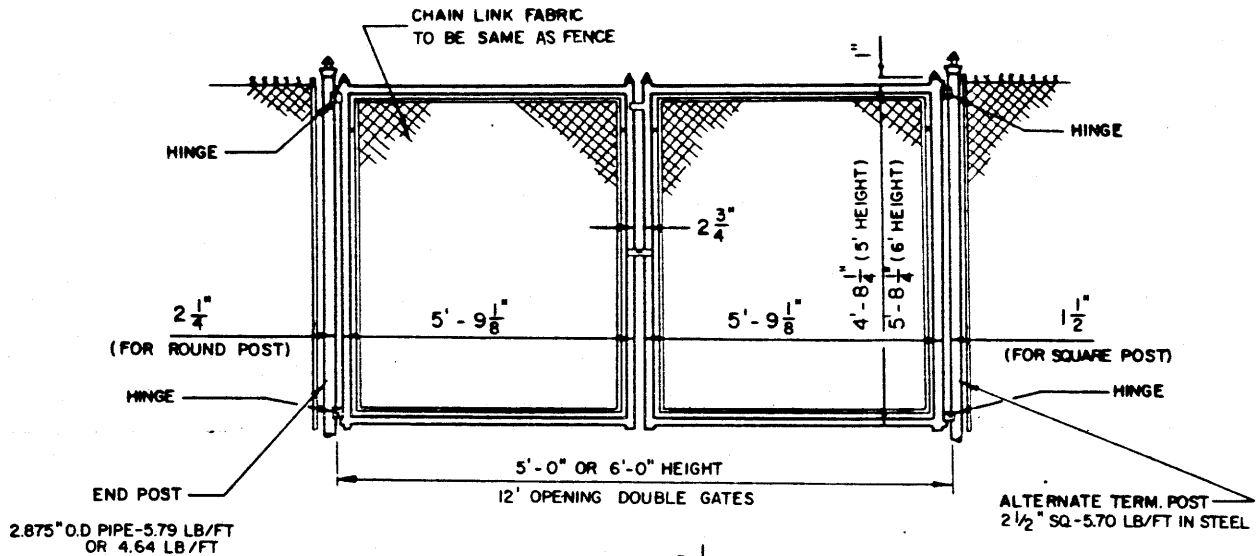
*L. Williams* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*J. Williams* 12/2/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



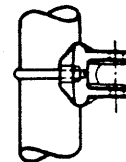
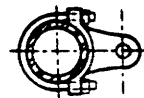
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

CHAIN LINK FENCE  
DRIVE ANCHOR ADAPTER

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-26



SQUARE POST HINGE



ROUND POST HINGE

*Ed. Alford* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*D. Jackson* 2/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE

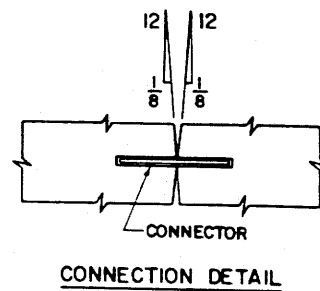
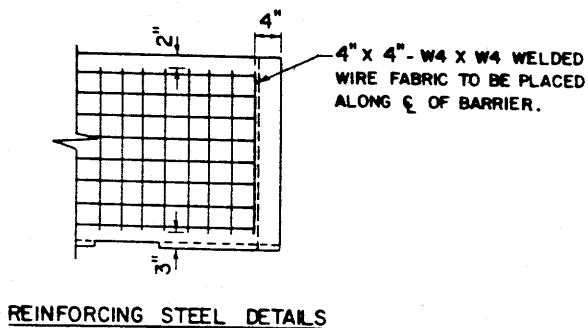
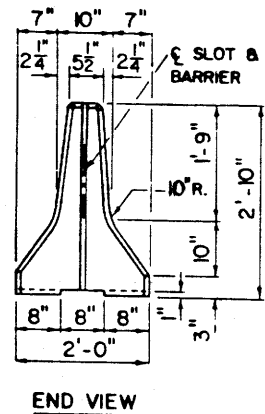
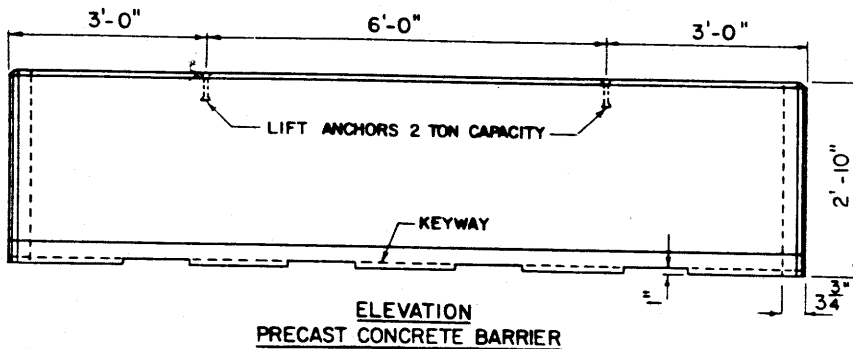
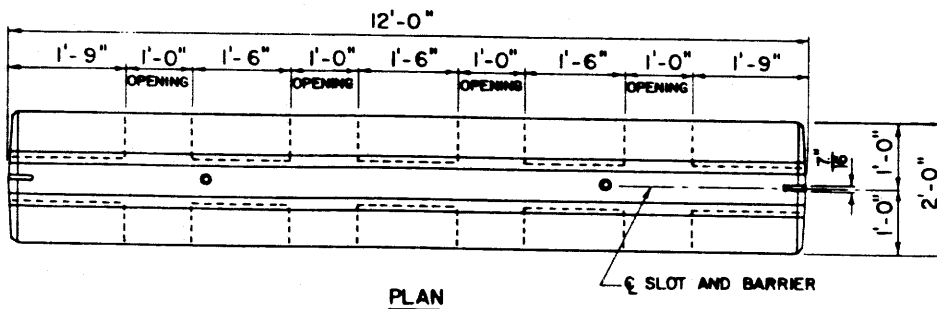


HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

# CHAIN LINK FENCE GATE DETAILS

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S - 27





GENERAL NOTES:

1. ALL CONCRETE FOR BARRIER TO BE MIX. NO. 6 (4500 PSI)
2. EXPOSED FACE AND TOP OF PRECAST BARRIER TO BE COVERED WITH TWO COATS OF WHITE EPOXY PAINT IN ACCORDANCE WITH THE PROVISIONS OR THE SUPPLEMENT TO THE SPECIFICATIONS.
3. 27" x 7" x 5/8" GALVANIZED STEEL PLATE-TO BE FURNISHED AS CONNECTOR, AND INCIDENTAL TO THE CONCRETE BARRIER.

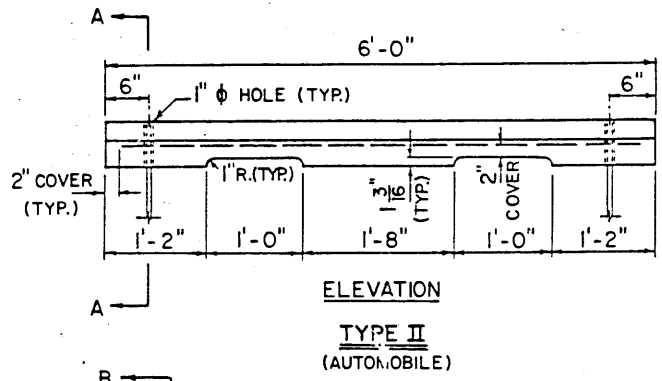
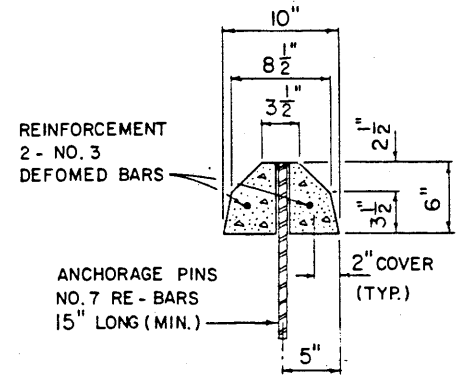
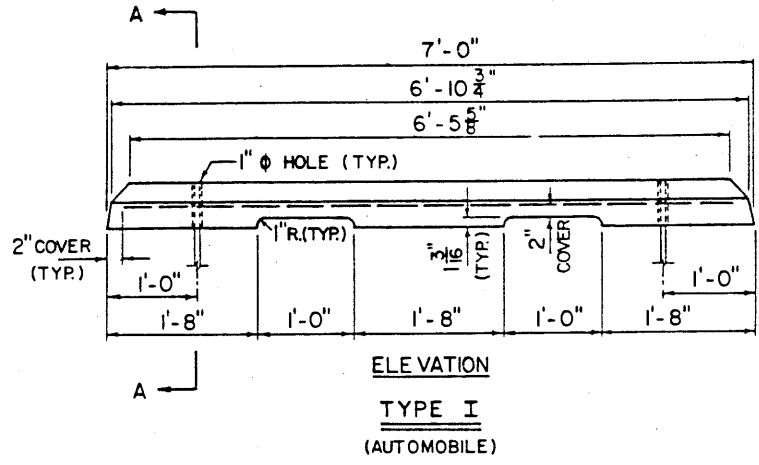
*L. R. Adams* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*J. J. Hudson* 4/2/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



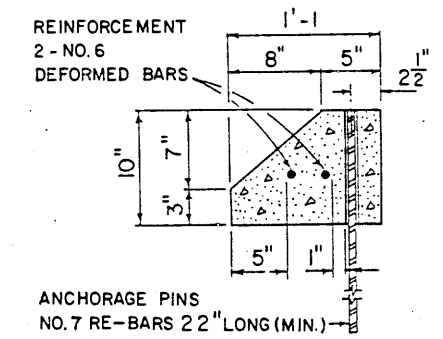
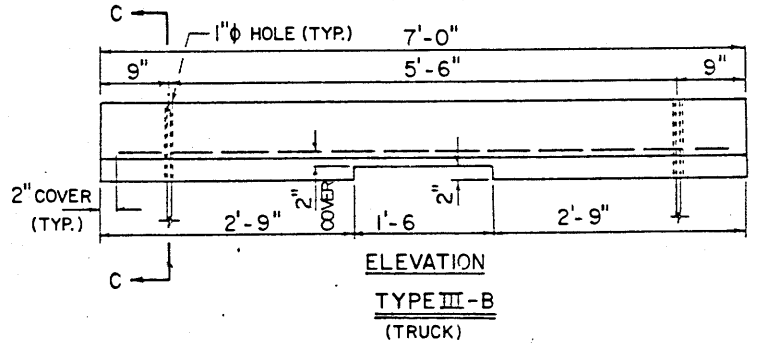
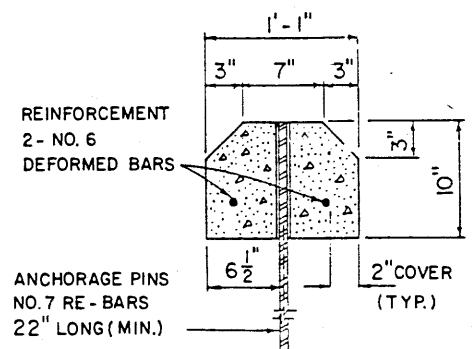
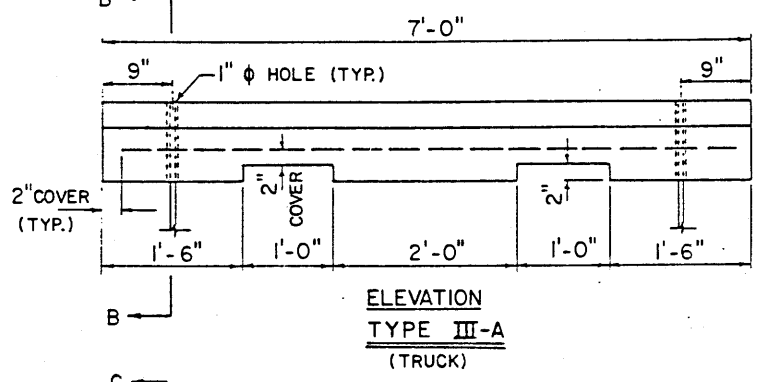
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

PRECAST CONCRETE BARRIER  
DOUBLE FACE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-28



SECTION A-A  
(TYPICAL - TYPE I & II)



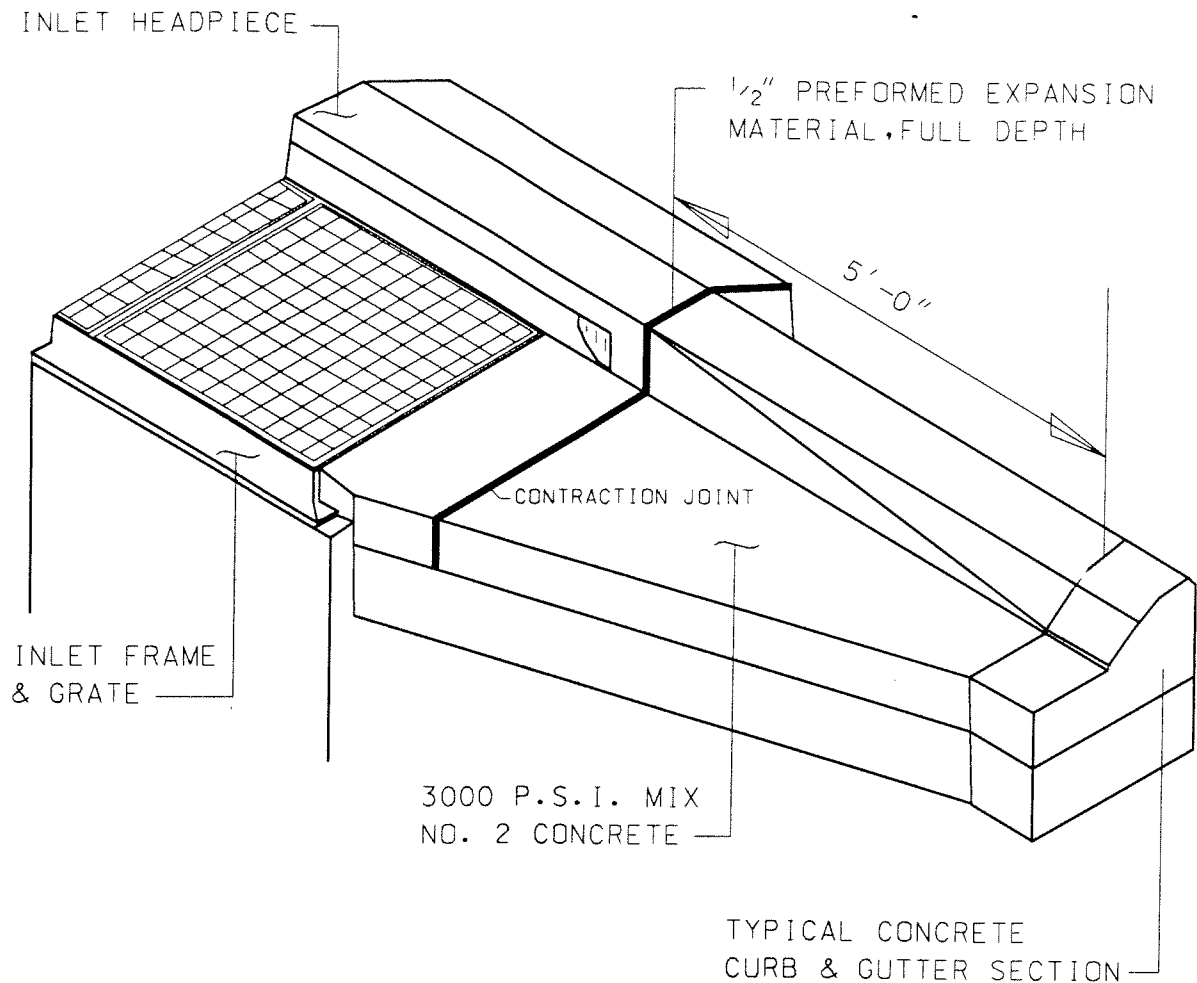
NOTE:  
 PRECAST CONCRETE WHEEL STOPS SHALL BE LOCATED AS SHOWN ON THE PLANS,  
 THEN SECURED IN PLACE WITH TWO (2) NO. 7 REINFORCEMENT BARS PER WHEEL STOP.



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

PRECAST CONCRETE  
 WHEEL STOPS

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE S-29



NOTES:

1. TYPICAL BOTH SIDES OF INLET
2. FOR CONSTRUCTION DETAILS, SEE  
PLATE S-1, S-2, OR S-3.

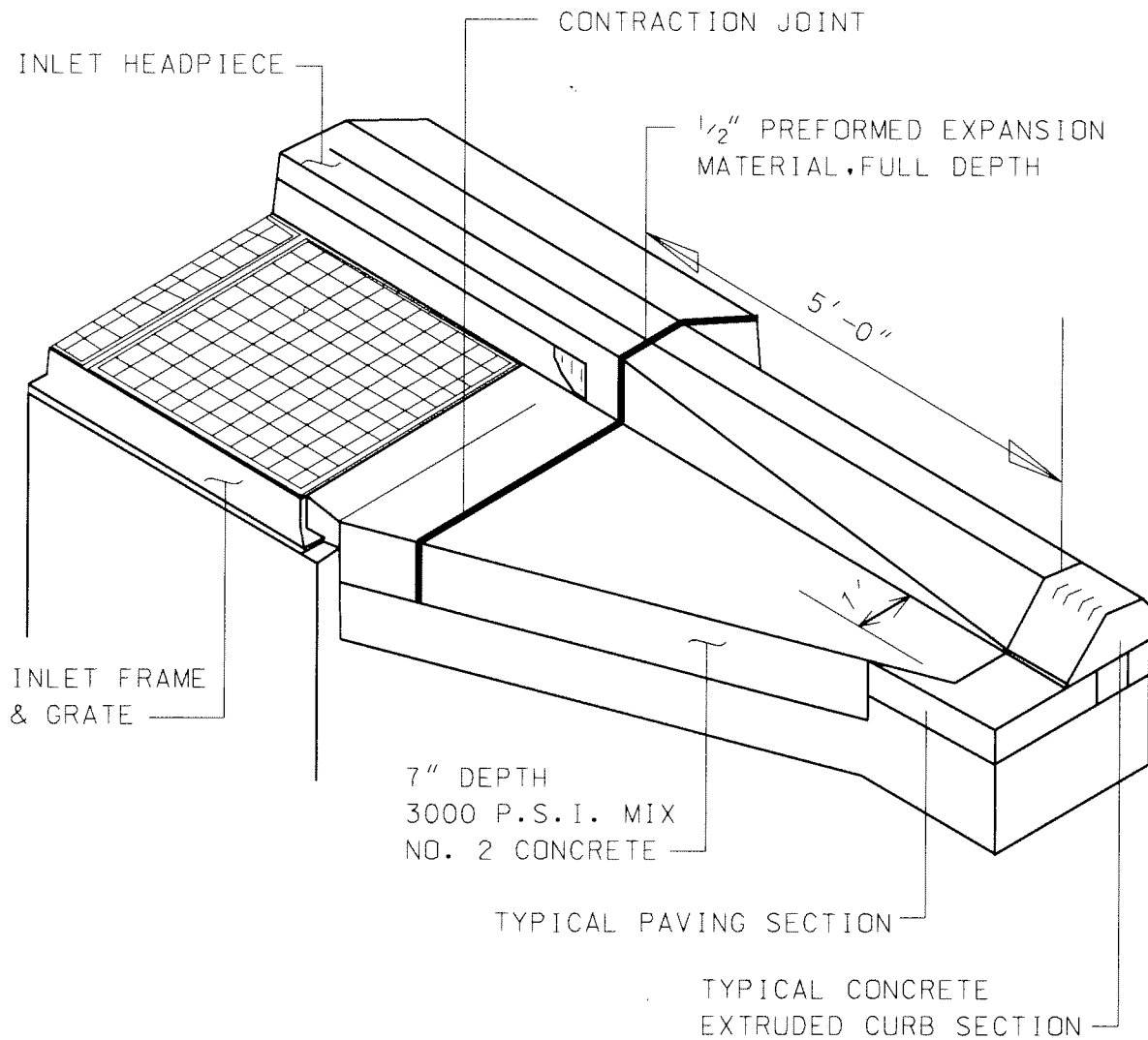
<i>[Signature]</i>	5-2-00
DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	4/12/00
DEP. DIRECTOR, PUBLIC WORKS	DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

# CURB & GUTTER TRANSITION @ INLETS

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE S-30



NOTES:

1. TYPICAL BOTH SIDES OF INLET
2. FOR CONSTRUCTION DETAILS, SEE PLATE S-4.

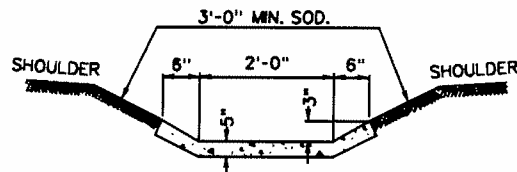
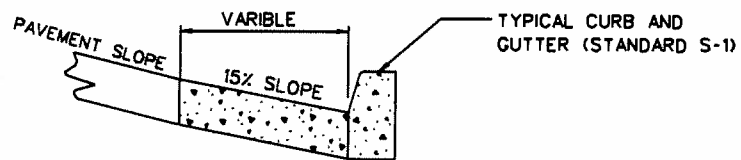
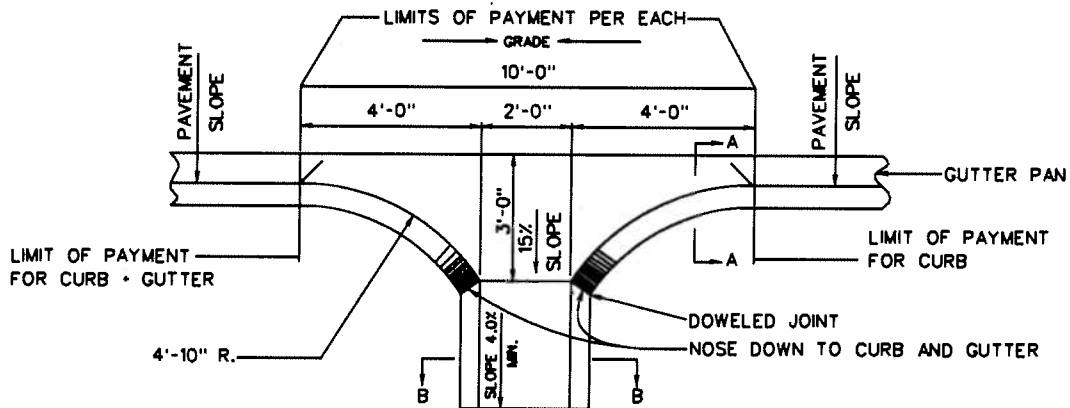
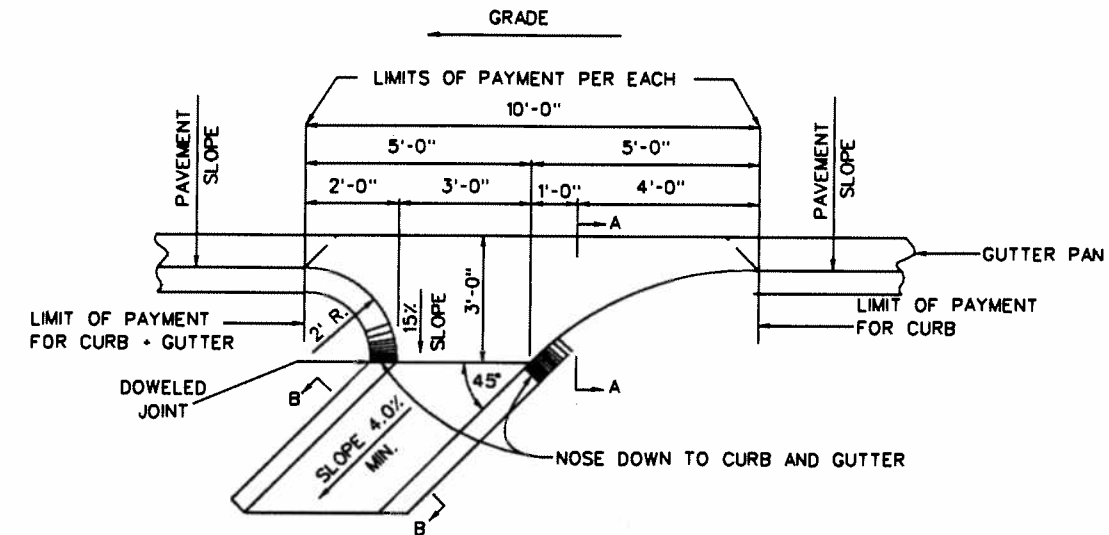
*John A. ...* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*D. Hudson Myer, III* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

EXTRUDED CURB  
 TRANSITION @ INLETS

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE S-31



L. C. Adams, Jr. 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
 W. Hudson Myers, Jr. 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

STANDARD CURB OPENING DETAIL  
 CURB & GUTTER SECTION1

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE S-32

## SECTION V

### DRAINAGE

	<u>Plate</u>
Type "A" Head Wall Circular Pipe.....	D-1
Type "A" Head Wall Metal Pipe Arch .....	D-2
Type "A" Head Wall Elliptical Concrete Pipe.....	D-3
End Support Wall Round Pipe.....	D-4
End Support Wall Arch Pipe.....	D-5
Standard Head Walls B-48, B-54, B-60.....	D-6
Standard Head Walls B-66, B-72, B-78, B-84.....	D-7
Type "A" Head Wall Pipe Arch 73" by 55", 84" by 61" .....	D-8
Type "A" Head Wall Pipe Arch 95" by 67", 106" by 73" 117" by 79", 131" by 85" .....	D-9
Hook Bolt Detail - Str. Plate Pipe and Pipe Arches.....	D-10
Standard Type "C" End Wall Round Pipe .....	D-11
Standard Type "C" End Wall Arch Pipe.....	D-12
Type "E" End Wall Round Pipe.....	D-13
Type "E: End Wall Arch Pipe.....	D-14
Standard Type "H" End Wall Round Pipe .....	D-15
Concrete End Section Round Concrete Pipe .....	D-16
Concrete End Section Round Concrete Pipe .....	D-17
Metal End Section – Round Metal Pipe.....	D-18
Metal End Section – Arch Metal Pipe .....	D-19

Connections – Metal End Sections .....	D-20
Type "S" Inlet .....	D-21
Type "S" Combination Inlet.....	D-22
Double Type "S" Inlet.....	D-23
Double Type "S" Combination Inlet.....	D-24
Reserved for Future Use .....	D-25
Double Type "S" Combination Inlet Perpendicular to Curb .....	D-26
Structural Requirements – Precast Single Type "S" and Combination Type "S" Inlet.....	D-27
Structural Requirements – Precast Type "S" and Type "S" Combination Inlet.....	D-28
Structural Requirements – Precast Double Type "S" and Double Type "S" Combination Inlet .....	D-29
Frame and Grate, Single Type "S" Inlet and Combination.....	D-30
Tilt Bar Grate Standard "S" Size .....	D-30A
Frame and Grate, Double Type "S" Inlet and Combination .....	D-31
Curved Vane (S-CV Grate) for Type "S" Inlet Frames .....	D-32
Standard "COG" Inlets – 5', 10', 15' and 20' .....	D-33
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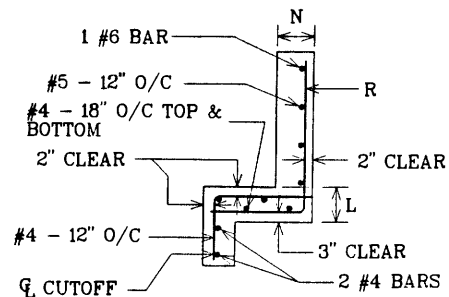
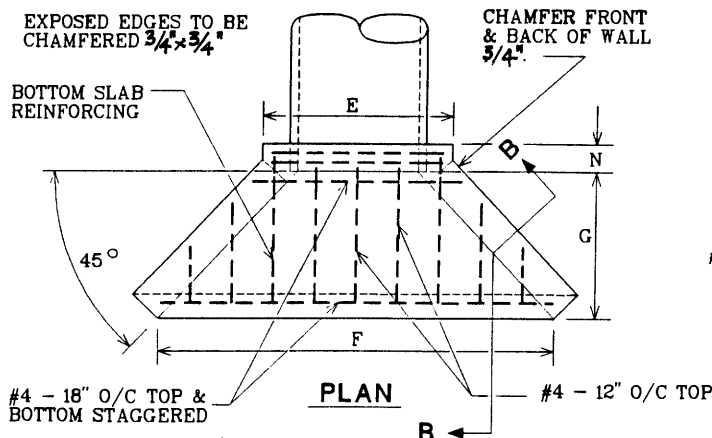


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EXPOSED EDGES TO BE  
CHAMFERED  $\frac{3}{4} \times \frac{3}{4}$ "

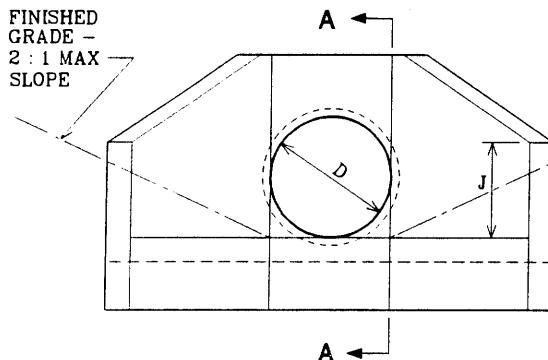
BOTTOM SLAB  
REINFORCING

CHAMFER FRONT  
& BACK OF WALL  
 $\frac{3}{4} \times \frac{3}{4}$ "

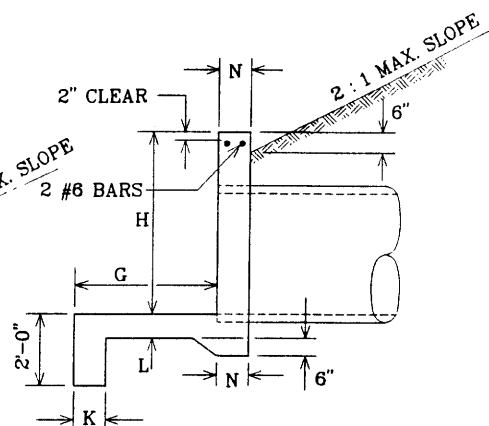


SECTION B-B

FINISHED  
GRADE -  
2 : 1 MAX  
SLOPE



FRONT ELEVATION



SECTION A-A

D	E	F	G	H	J	K	L	N	R	AVOL.C.Y.
15'-18"	3'-0"	7'-6"	3'-0"	3'-0"	2'-0"	8"	8"	8"	#5-12" O/C	1.70
21"	3'-4"	7'-9"	3'-0"	3'-3"	2'-0"	8"	8"	8"	#5-12" O/C	1.80
24"	3'-8"	8'-0"	3'-0"	3'-6"	2'-0"	8"	8"	8"	#5-12" O/C	1.90
27"	3'-11"	8'-3"	3'-0"	3'-9"	2'-0"	8"	8"	8"	#5-12" O/C	2.00
30"	4'-2"	8'-6"	3'-0"	3'-6"	2'-0"	8"	8"	10"	#5-12" O/C	2.85
36"	4'-8"	10'-0"	3'-6"	4'-6"	2'-3"	8"	10"	10"	#5-12" O/C	3.15
42"	5'-3"	11'-6"	4'-0"	5'-0"	2'-9"	8"	10"	10"	#5-12" O/C	3.87
48"	5'-10"	13'-0"	4'-6"	5'-6"	3'-0"	8"	10"	12"	#5-12" O/C	5.08
54"	6'-5"	14'-6"	5'-0"	6'-0"	3'-3"	9"	12"	12"	#6-8" O/C	6.50
60"	7'-0"	16'-0"	5'-6"	6'-6"	3'-6"	9"	12"	12"	#6-8" O/C	7.98
66"	7'-7"	17'-6"	6'-0"	7'-0"	3'-9"	9"	12"	14"	#6-8" O/C	9.14
72"	8'-2"	19'-0"	6'-6"	7'-6"	4'-3"	9"	12"	14"	#6-8" O/C	11.10

Δ BASED ON 2:1 CHANNEL SIDE  
SLOPES.

NOTE:

HEADWALL TO BE PARALLEL  
TO C. OF ROADWAY UNLESS  
OTHERWISE NOTED IN THE  
CONTRACT DRAWINGS.

CONCRETE VOLUME BASED ON  
2:1 SIDE SLOPES. TO BE USED FOR  
ESTIMATING ONLY.

CONCRETE: MIX #3

PRECASTING THIS ENDWALL: SEE  
NOTE 4, DETAIL D-3

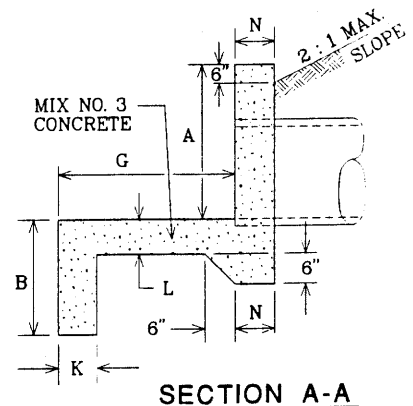
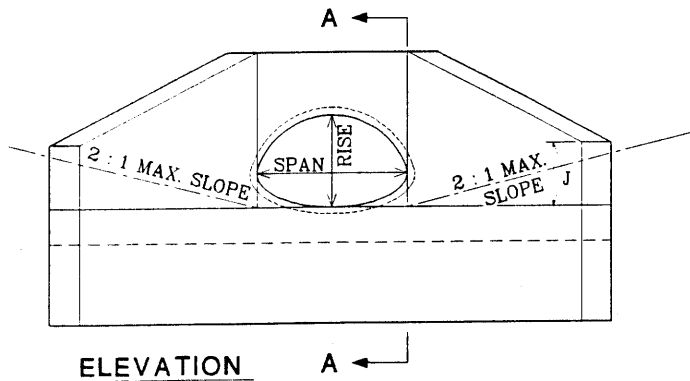
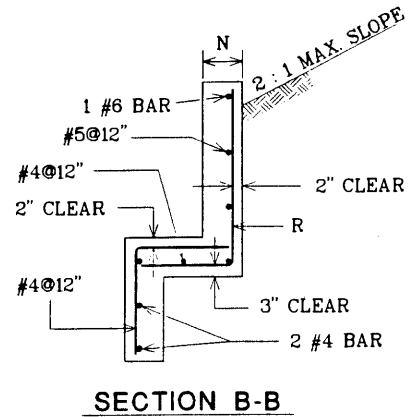
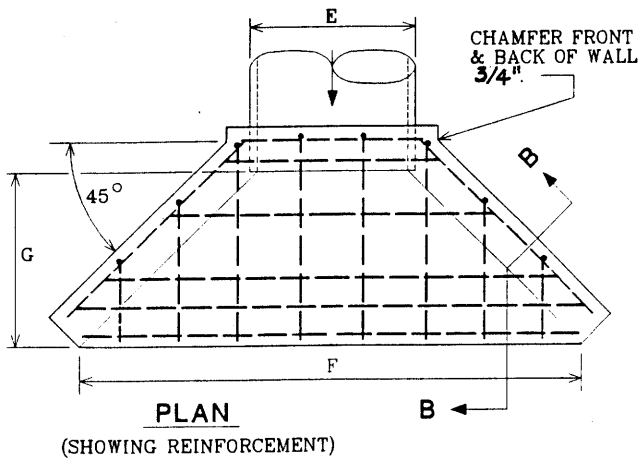
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TYPE "A" HEADWALL  
CIRCULAR PIPE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-1



Δ BASED ON 2:1 CHANNEL SIDE SLOPES. SEE NOTE 2

EQ. RD.	SPAN	RISE	A	B	E	F	G	J	K	L	N	R	Δ CONC. C. Y.
18"	21"	15"	2'-3"	2'-0"	2'-9"	7'-9"	3'-0"	1'-0"	8"	8"	8"	#5@12"	1.12
24"	28"	20"	2'-8"	2'-0"	3'-4"	8'-4"	3'-0"	1'-4"	8"	8"	8"	#5@12"	1.29
30"	35"	24"	3'-0"	2'-0"	3'-11"	8'-11"	3'-0"	1'-4"	8"	8"	8"	#5@12"	1.45
36"	42"	29"	3'-5"	2'-0"	4'-5"	9'-6"	3'-0"	1'-11"	8"	10"	8"	#5@12"	1.74
42"	49"	33"	3'-9"	2'-0"	5'-1"	10'-1"	3'-0"	2'-3"	8"	10"	8"	#5@12"	1.93
48"	57"	38"	4'-2"	2'-0"	5'-9"	11'-9"	3'-6"	2'-5"	8"	10"	8"	#5@12"	2.46
54"	64"	43"	4'-7"	2'-0"	6'-4"	13'-0"	3'-10"	2'-8"	9"	12"	10"	#5@12"	3.47
60"	71"	47"	4'-11"	2'-0"	6'-11"	14'-3"	4'-2"	2'-10"	9"	12"	10"	#5@12"	4.02

- NOTES:
1. CHAMFER EXPOSED EDGES  $\frac{3}{4} \times \frac{3}{4}$ "
  2. CONCRETE QUANTITIES TO BE USED FOR ESTIMATING ONLY.
  3. HEADWALL TO BE PARALLEL TO  $\frac{1}{2}$  OF ROADWAY UNLESS OTHERWISE NOTED ON CONTRACT DRAWINGS.
  4. PRECASTING THIS ENDWALL: SEE NOTE 4. DETAIL D-3

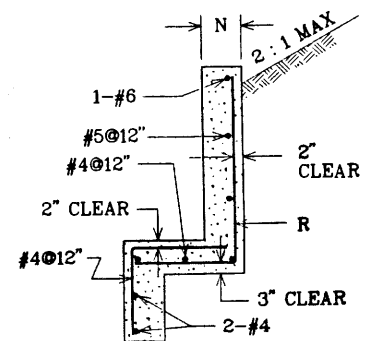
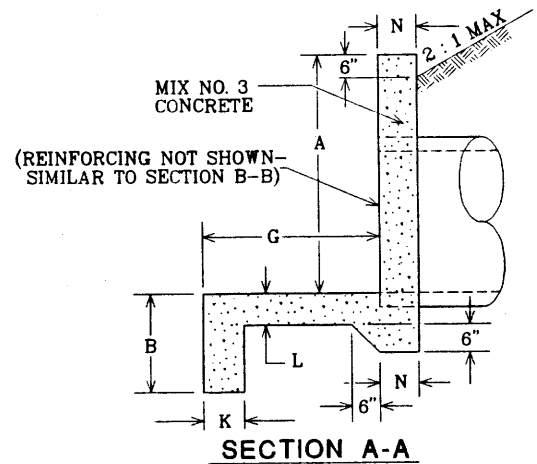
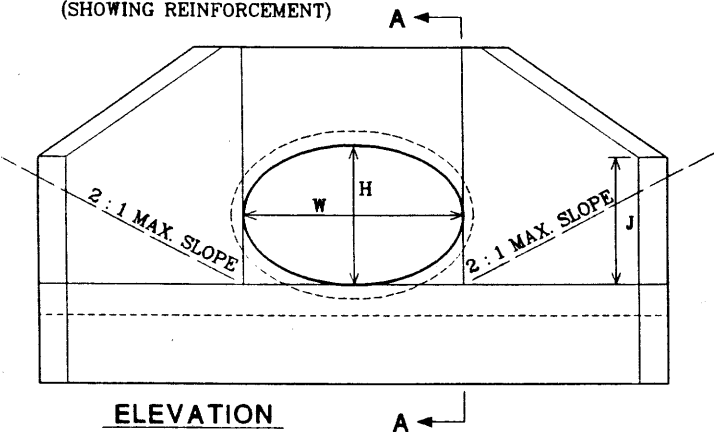
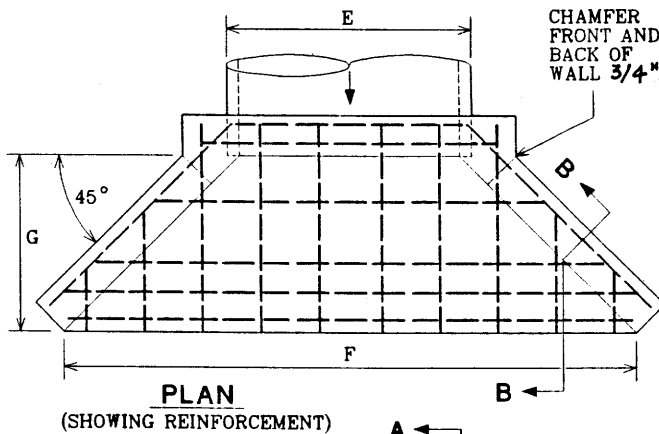
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**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

# **TYPE "A" HEADWALL** **METAL PIPE ARCH**

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE **D-2**



EQ. RD.	W	H	A	B	E	F	G	J	K	L	N	R	Δ VOL. C.Y.
36"	45"	29"	3'-9"	2'-0"	5'-6"	9'-9"	3'-0"	2'-0"	8"	10"	8"	#5@12"	2.17
42"	53"	34"	4'-3"	2'-0"	6'-3"	11'-5"	3'-6"	2'-3"	8"	10"	10"	#5@12"	2.99
48"	60"	38"	4'-8"	2'-0"	7'-0"	12'-4"	3'-8"	2'-6"	8"	10"	10"	#5@12"	3.38
54"	68"	43"	5'-3"	2'-0"	7'-8"	13'-8"	4'-0"	2'-9"	9"	12"	10"	#5@12"	4.53
60"	76"	48"	5'-6"	2'-0"	8'-5"	15'-4"	4'-6"	3'-0"	9"	12"	10"	#5@12"	5.32
66"	83"	53"	6'-0"	2'-0"	9'-1"	17'-0"	5'-0"	3'-3"	9"	12"	12"	#6@8"	7.07
72"	91"	58"	6'-6"	2'-0"	9'-10"	18'-3"	5'-4"	3'-6"	9"	12"	12"	#6@8"	7.88

Δ SEE NOTE 2

#### NOTES:

1. CHAMFER EXPOSED EDGES  $\frac{3}{4} \times \frac{3}{4}$ "
2. CONCRETE QUANTITIES TO BE USED FOR ESTIMATING ONLY.
3. HEADWALL TO BE PARALLEL TO G. OF ROADWAY UNLESS OTHERWISE NOTED IN THE CONTRACT DRAWINGS.
4. PRECAST WALL WITH DIMENSIONS AND REINFORCEMENT EQUIVALENT TO CAST IN PLACE WALL SHOWN WILL BE CONSIDERED. PROVIDE SHOP DRAWING SHOWING REINFORCEMENT AND MEANS OF WALL-TO-TOE CONNECTION. PLACE ON UNDISTURBED EARTH OR POUR CONCRETE FOOTING TO SAME. PRECAST WALLS THAT ARE CUT OR BROKEN FOR ANY REASON WILL BE REJECTED. PRECAST CONCRETE: 4500 psi MIN.

*[Signature]* 5-20  
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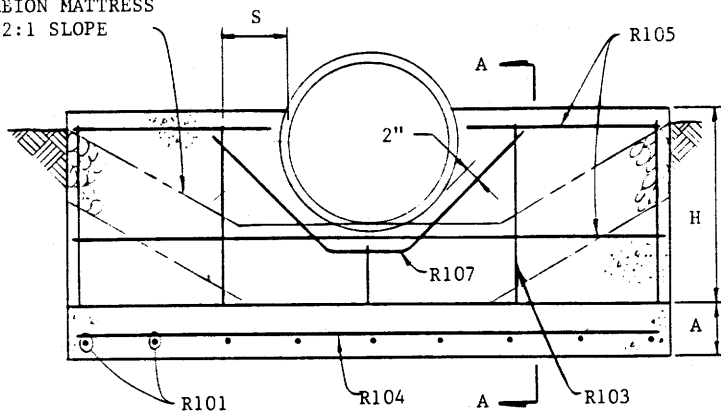


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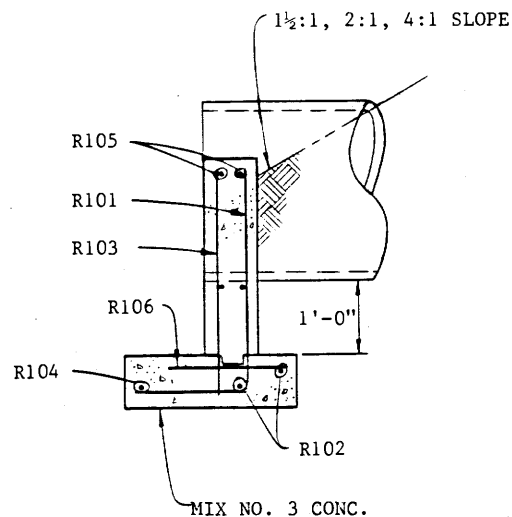
## TYPE "A" HEADWALL ELLIPTICAL CONCRETE PIPE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-3

GABION MATTRESS  
2:1 SLOPE



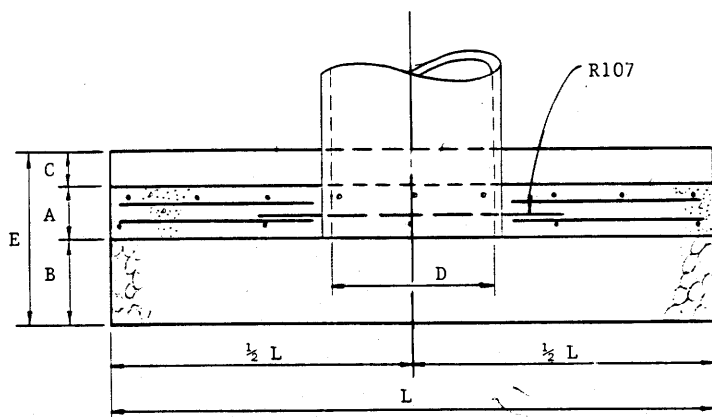
ELEVATION (SURFACE REMOVED)



SECTION A - A

S = Distance from inside surface of pipe  
to vertical bars in front and rear face:  
4" for 12" - 18" dia. pipes  
6" for 24" - 36" dia. pipes  
8" for 42" - 60" dia. pipes

NOTE: KEY TO BE 4" W. x 2" D., CENTERED  
IN ENDWALL.



PLAN (SURFACE REMOVED)

Openings		Dimensions						Vol.	Steel
D Inches	Area Sq. Ft.	A	B	C	E	H	L	Conc C.Y.	LBS
12"	0.79	9"	6"	6"	1'9"	1'10"	4'0"	0.38	29
15"	1.23	9"	6"	6"	1'9"	2'0"	4'9"	0.47	34
18"	1.79	9"	6"	6"	1'9"	2'3"	5'6"	0.56	41
24"	3.14	9"	14"	6"	2'5"	2'6"	7'0"	0.88	56
30"	4.91	9"	14"	6"	2'5"	2'9"	8'6"	1.12	79
36"	7.07	12"	16"	10"	3'2"	3'0"	10'0"	2.11	115
42"	9.52	12"	16"	10"	3'2"	3'3"	11'6"	2.50	124
48"	12.57	12"	16"	10"	3'2"	3'6"	13'0"	2.91	151
54"	15.90	12"	20"	12"	3'8"	3'9"	14'6"	3.62	168
60"	19.64	12"	20"	12"	3'8"	4'0"	16'0"	4.09	196

REINFORCING BARS

REBAR NO.	SIZE	TYPE	C/C	AMT.	USE
R101	#4	BENT	1'-0"	VARIE	A
R102	#4	STR.	—	2	D
R103	#4	STR.	—	VARIE	B
R103	#4	STR.	2'-0" max.	VARIE	C
R104	#4	STR.	—	1	A
R105	#4	STR.	1'-7" max.	VARIE	A
R106	#4	STR.	1'-0"	VARIE	D
R107	#4	BENT	—	1	A

USES: A = ALL ENDWALLS  
B = 12" - 18" DIA. PIPES  
C = 24" - 60" DIA. PIPES  
D = 36" - 60" DIA. PIPES

*L. A. Jones* 5200  
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*V. Hudson Myers, Jr.* 4/12/00  
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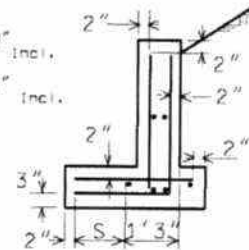
HARFORD COUNTY, MD  
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END SUPPORT WALL  
ROUND PIPE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-4

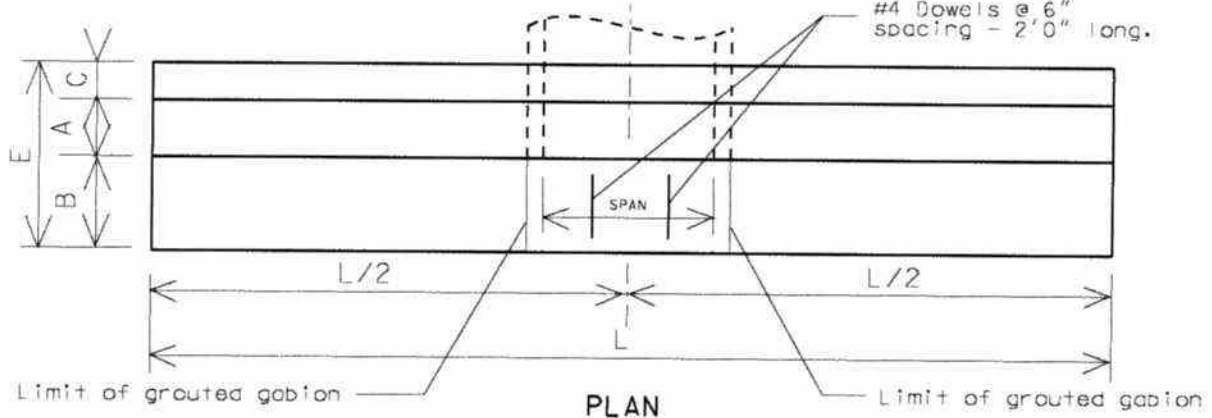
Openings		Dimensions						Vol. Steel	
Size	Area	A	B	C	E	H	L	Conc.	Steel
Inches	Sq. Ft.							C.Y.	Lbs.
28"x20"	2.2	9"	14"	6"	2'5"	2'0"	6'0"	0.68	49
35"x24"	4.4	9"	14"	6"	2'5"	2'3"	7'6"	0.88	59
42"x29"	4.8	12"	16"	10"	3'2"	2'6"	8'11"	1.70	81
47"x33"	6.5	12"	16"	10"	3'2"	2'9"	10'5"	2.05	129
57"x38"	8.7	12"	16"	10"	3'2"	3'0"	12'2"	2.46	164
64"x43"	11.0	12"	20"	12"	3'8"	3'3"	13'8"	3.10	189
71"x47"	13.5	12"	20"	12"	3'8"	3'6"	15'2"	3.53	214

S Distances:  
 6" for 28"x20"  
 to 42"x29" Incl.  
 8" for 47"x33"  
 to 71"x47" Incl.

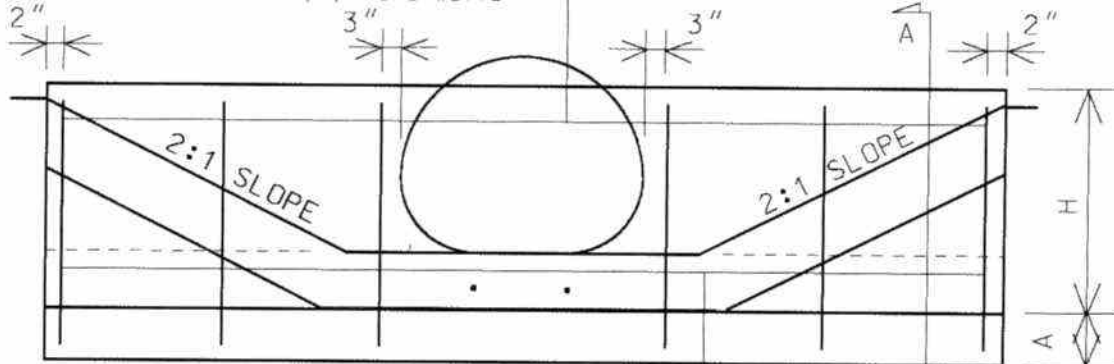


### DISPOSITION OF BARS

#4 Dowels @ 6" spacing - 2'0" long.



4 - #4 Straight bars vertical in front face for 28"x20" and 35"x24" pipe end walls.



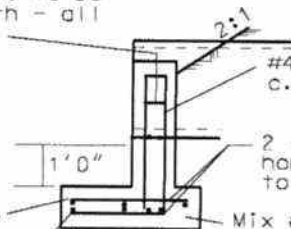
#4 Straight bars vertical @ 1'-6" min. to 2'0" max. front face 42"x29" to 71"x47" pipe end walls inclusive.

#4 Straight bars horizontal @ 1'-7" max. c.c. both faces. Bottom bars to be full length - all end walls

### ELEVATION

#4 Straight horizontal @ 1'0" c.c. both sides opening for 47"x33" to 71"x47" pipe end walls.

1 - #4 Straight bar horizontal all end walls.



#4 Bent bars @ 1'0" c.c. all end walls.

2 - #4 Straight bars horizontal for 47"x33" to 71"x47" end walls.

Mix #3 Concrete

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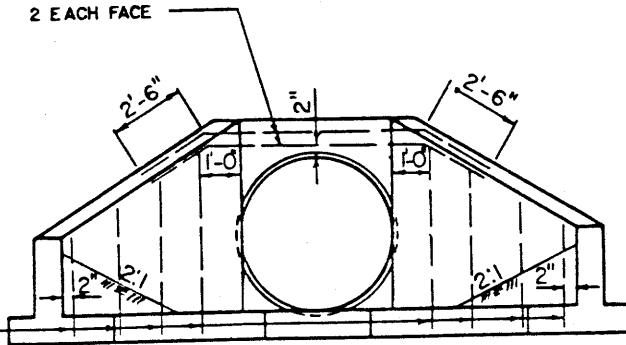
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 PUBLIC WORKS

END SUPPORT WALL  
 ARCH PIPE

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-5

*W. H. H. H. H.* 5-2-00  
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4-#6 BENT BARS HORIZONTAL  
 2 EACH FACE

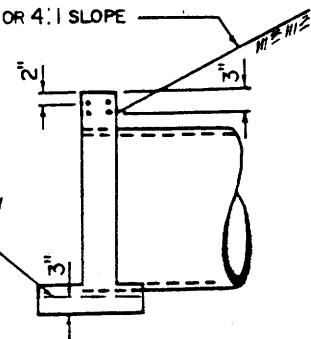


ELEVATION

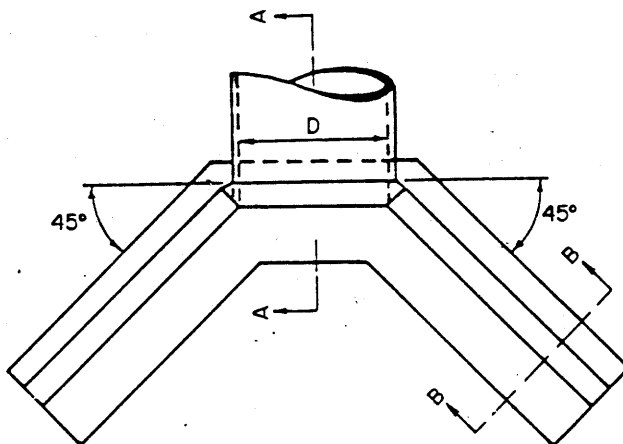
#4 STRAIGHT BARS VERTICAL  
 @ 1'-6" MIN. TO 2'-0" MAX.  
 FRONT FACE

1 1/2 : 1, 2:1 OR 4:1 SLOPE

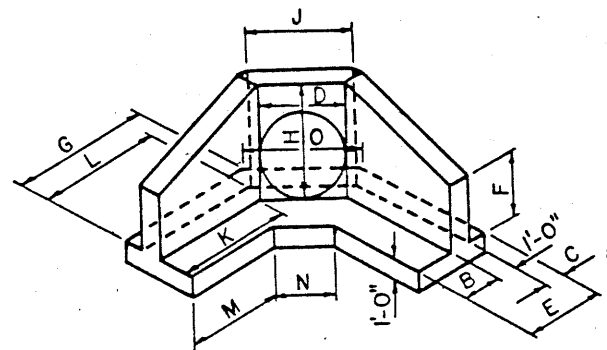
#4 BARS HORIZONTAL  
 @ 1'-0" C/C BELOW  
 OPENING



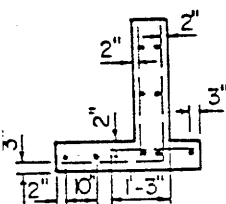
SECTION A-A



PLAN



ISOMETRIC VIEW



DISPOSITION OF  
 BARS DETAIL

GENERAL NOTES:

Concrete Mix No. 3

REINFORCING: DEFORMED STEEL BARS #4 & #6

CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS DIRECTED

#4 BARS HORIZONTAL @ 1'-7" MAX. C/C BOTH  
 FACES BOTTOM BARS BENT ALONG ENDWALL  
 OTHERS STRAIGHT.

1-#4 BENT BAR HORIZONTAL

1-#4 BENT BAR HORIZONTAL

#4 BENT BARS @ 1'-0" C/C BOTH  
 WINGWALLS - ALL ENDWALLS

2-#4 STRAIGHT BARS HORIZONTAL,  
 1 EACH WINGWALL

#4 STRAIGHT BARS HORIZONTAL  
 @ 1'-0" C/C @ BOTH SIDES OF  
 OPENING

SECTION B-B

OPENING		DIMENSIONS												VOL. CONC. C.Y.	STEEL LBS.
D INCHES	AREA SQ. FT.	B	C	E	F	G	H	J	K	L	M	N	O		
48	12.57	1'-4"	10"	3'-2"	2'-9"	7'-0 3/4"	5'-0"	4'-10"	6'-3 1/2"	6'-8 1/2"	5'-9"	2'-10 3/4"	5'-6"	4.3	262
54	15.9	1'-8"	1'-0"	3'-8"	3'-0"	7'-8 1/2"	5'-6"	5'-4"	6'-10 1/2"	7'-3 1/2"	6'-2 1/4"	3'-1 1/2"	6'-2"	5.3	301
60	19.64	1'-8"	1'-0"	3'-8"	3'-3"	8'-5"	6'-0"	5'-10"	7'-7 1/4"	8'-0 1/4"	6'-11"	3'-7 1/2"	6'-8"	6.0	361

QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY



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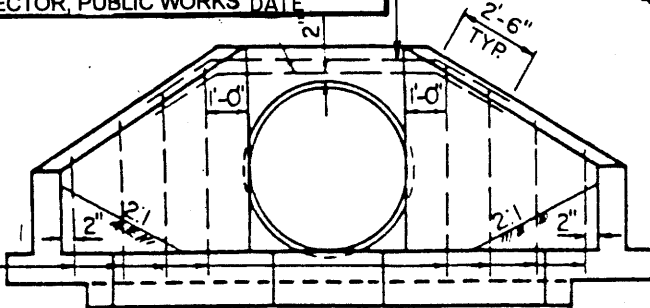
STANDARD HEADWALLS

B-48 B-54 B-60

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-6

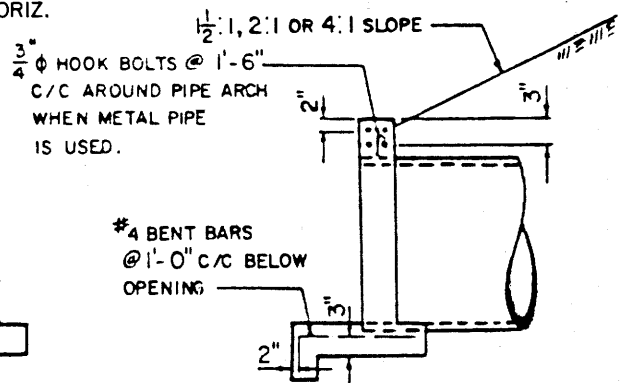
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4-#6 BENT BARS HORIZ.  
 2 EACH FACE



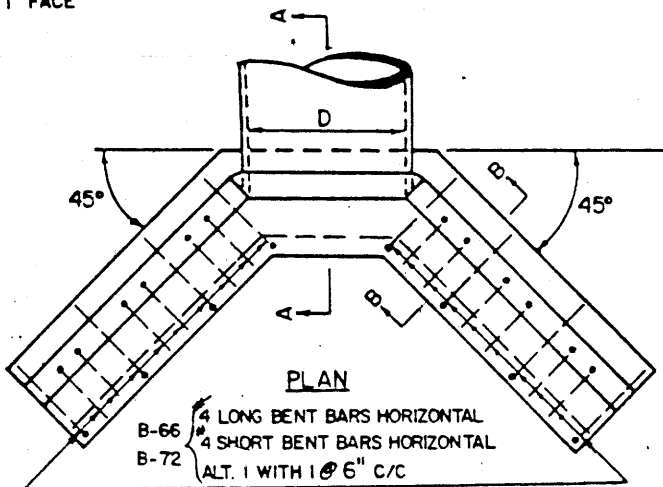
#4 STRAIGHT BARS VERTICAL  
 @ 1'-6" MIN. TO 2'-0" MAX.  
 IN FRONT FACE

ELEVATION

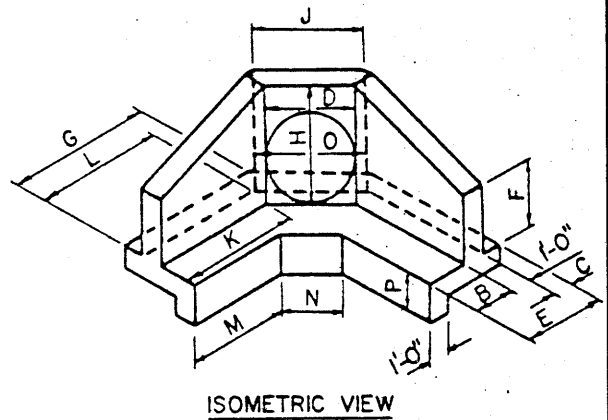


#4 BENT BARS  
 @ 1'-0" C/C BELOW  
 OPENING

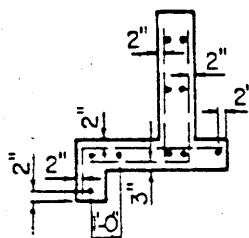
SECTION A-A



B-66 4 LONG BENT BARS HORIZONTAL  
 B-72 4 SHORT BENT BARS HORIZONTAL  
 ALT. 1 WITH 1 @ 6" C/C  
 B-78 4 LONG BENT BARS HORIZONTAL  
 B-84 4 SHORT BENT BARS HORIZONTAL  
 ALT. 1 WITH 2 RESP. 4" C/C

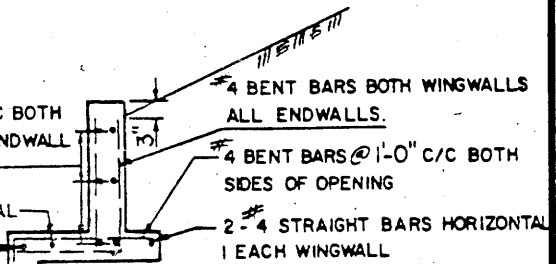


ISOMETRIC VIEW



DISPOSITION OF BARS DETAIL

#4 BARS HORIZONTAL @ 1'-7" MAX. C/C BOTH  
 FACES BOTTOM BARS BENT ALONG ENDWALL  
 OTHERS STRAIGHT.  
 1-#4 BENT BAR HORIZONTAL  
 2-#4 BENT BARS HORIZONTAL



SECTION B-B

GENERAL NOTES:

Concrete Mix No. 3

REINFORCING: DEFORMED STEEL BARS #4 & #6

CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS DIRECTED

OPENING		DIMENSIONS													VOL. CONC. C.Y.	STEEL LBS.
D INCHES	AREA SQ. FT.	B	C	E	F	G	H	J	K	L	M	N	O	P		
66	23.80	2'-6"	1'-3"	4'-9"	3'-0"	11'-2 1/2"	6'-8 1/2"	6'-4"	10'-3 1/4"	10'-8 1/2"	9'-3"	8'-5"	7'-4 1/2"	2'-0"	9.7	585
72	28.27	2'-6"	1'-3"	4'-9"	3'-3"	12'-1"	7'-3"	6'-10"	11'-1 3/4"	11'-6 3/4"	10'-1 1/2"	3'-11"	7'-10 1/2"	2'-0"	10.9	645
78	33.20	3'-0"	1'-6"	5'-6"	3'-6"	13'-0 1/2"	7'-9 1/2"	7'-4"	12'-0"	12'-5"	10'-9"	4'-0"	8'-6 3/4"	2'-6"	13.3	855
84	38.48	3'-0"	1'-6"	5'-6"	3'-9"	13'-10"	8'-4"	7'-10"	12'-9 1/2"	13'-2 1/2"	11'-6 1/2"	4'-6"	9'-0 3/4"	2'-6"	14.7	984

QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY



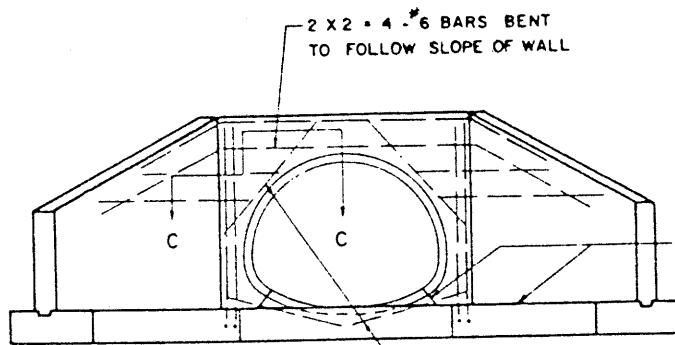
HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

STANDARD HEADWALLS  
 B-66, B-72, B-78, B-84

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-7



NOTE: OTHER BARS NOT SHOWN IN FRONT ELEVATION



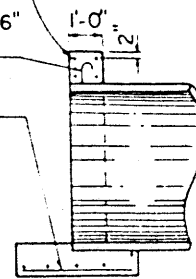
FRONT ELEVATION

4 - #6 HORIZONTAL BARS, ABOVE TOP OF PIPE ARCH, TO EXTEND 2'-6" BEYOND TURN IN WING.

$\frac{3}{4}$ "  $\phi$  HOOK BOLTS @ 1'-6" C/C AROUND PIPE ARCH

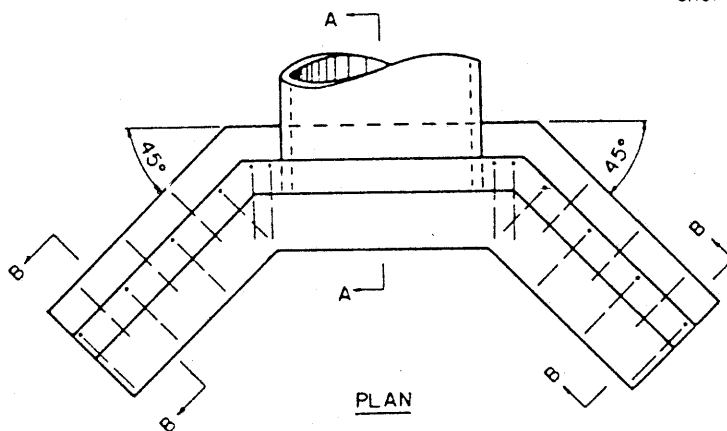
#4 BARS @ 1'-0" C/C

CONSTRUCTION JOINT

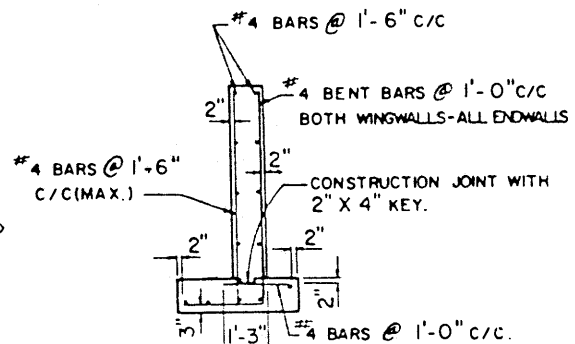


SECTION A-A

LONGITUDINAL BARS IN FOOTING UNDER PIPE TO BE #4 BARS SPACED AS SHOWN.



PLAN



SECTION B-B

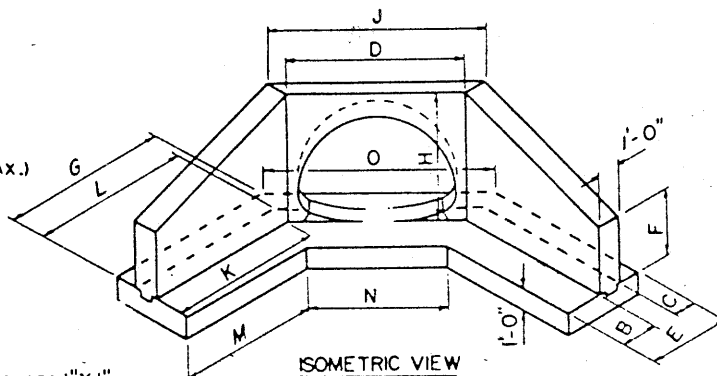
2-#4 BARS, REAR FACE BEND SAME AS STEM BARS

#4 BARS EACH FACE @ 1'-6" C/C

#4 HORIZONTAL BARS 1'-6" C/C (MAX.)

#4 BARS @ 1'-6" C/C (MAX.)

SECTION C-C



ISOMETRIC VIEW

Concrete Mix No. 3

CHAMFER

ALL EXPOSED EDGES 1" X 1" OR AS DIRECTED

HEADWALL SIZE

FOR INTERMEDIATE SIZE PIPE ARCHES USE NEXT LARGER SIZE HEADWALL

MAX. SPAN	MAX. RISE	MAX. AREA	D	B	C	E	F	G	H	J	K	L	M	N	Q	ONE HEADWALL VOL. CONC.	STEEL LBS.
73"	55"	22'	7'-9"	1'-8"	1'-0"	3'-8"	3'-0"	7'-8"	5'-9"	8'-7"	6'-10"	7'-3"	6'-2"	6'-4"	9'-5"	6.0	430
84"	61"	28'	8'-8"	1'-8"	1'-0"	3'-8"	3'-3"	8'-5"	6'-3"	9'-6"	7'-7"	8'-0"	6'-11"	7'-3"	10'-4"	7.0	480

*John A. ...*  
DIRECTOR OF PUBLIC WORKS

5200  
DATE

*W. Jackson Mayo, Jr.*  
DEP. DIRECTOR, PUBLIC WORKS

4/12/00  
DATE



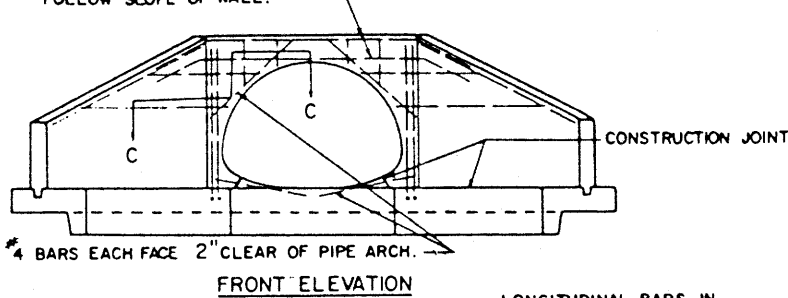
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

TYPE "A" HEADWALL  
PIPE ARCH  
73"x55"; 84"x61"

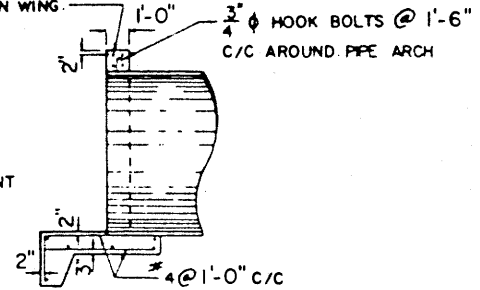
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-8

NOTE: OTHER BARS NOT SHOWN IN FRONT ELEVATION

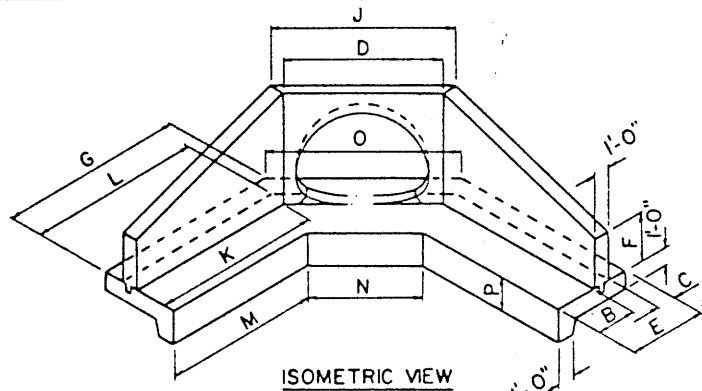
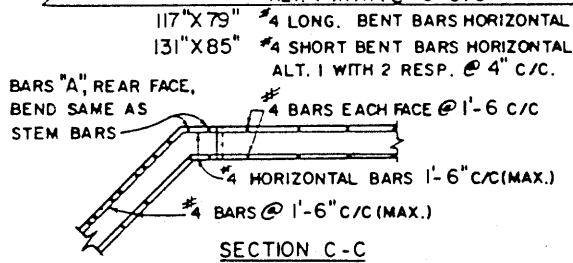
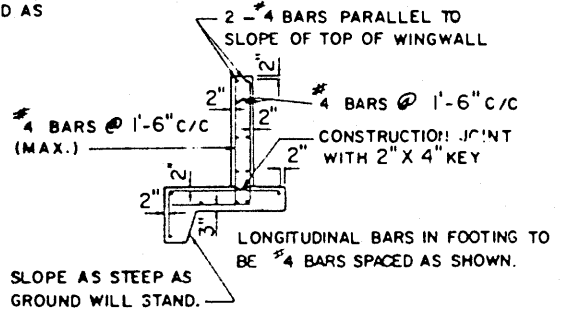
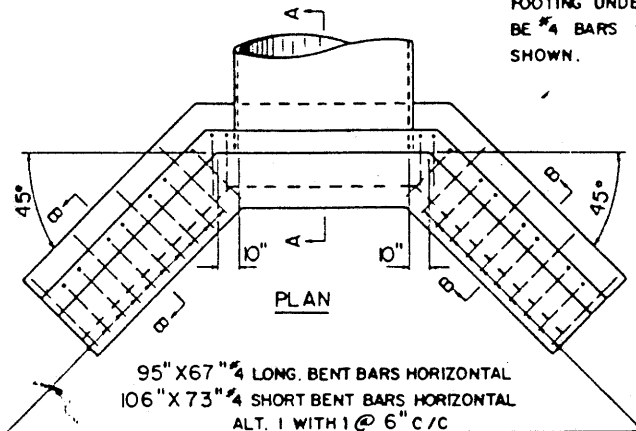
2 X 2 = 4 - #6 BARS BENT TO FOLLOW SLOPE OF WALL.



4 - #6 HORIZONTAL BARS, ABOVE TOP OF PIPE ARCH, TO EXTEND 2'-6" BEYOND TURN IN WING.



LONGITUDINAL BARS IN FOOTING UNDER PIPE TO BE #4 BARS SPACED AS SHOWN.



### Concrete Mix No. 3

CHAMFER ALL EXPOSED EDGES 1" X 1" OR AS DIRECTED.  
HEADWALL SIZE FOR INTERMEDIATE SIZE PIPE ARCHES USE NEXT LARGER SIZE HEADWALL

HEADWALL SIZE																	FOR INTERMEDIATE SIZE PIPE ARCHES USE NEXT LARGER SIZE HEADWALL																	ONE HEADWALL		
MAX. SPAN	MAX. RISE	MAX. AREA	D	B	C	E	F	G	H	J	K	L	M	N	O	P	VOL. CONC.	STEEL LBS.	BARS A																	
95"	67"	35 □	9'-7"	2'-6"	1'-3"	4'-9"	3'-0"	11'-2 1/2"	6'-9"	10'-5"	10'-3 1/4"	10'-8 1/2"	9'-3 3/4"	7'-6"	11'-5 1/2"	2'-0"	11.3	700	2-#5 BARS																	
106"	73"	43 □	10'-6"	2'-6"	1'-3"	4'-9"	3'-3"	12'-1"	7'-3"	11'-4"	11'-1 3/4"	11'-6 3/4"	10'-1 1/4"	18'-5"	12'-4 1/2"	2'-0"	12.6	760	2-#5 BARS																	
117"	79"	52 □	11'-5"	3'-0"	1'-6"	5'-6"	3'-6"	13'-0 1/2"	7'-9"	12'-3"	12'-0"	12'-5"	10'-9"	8'-11"	13'-5 3/4"	2'-6"	15.5	1080	2-#6 BARS																	
131"	85"	61 □	12'-7"	3'-0"	1'-6"	5'-6"	3'-9"	13'-10"	8'-3"	13'-5"	12'-9 1/2"	13'-2 1/2"	11'-6 1/2"	10'-1"	14'-7 1/4"	2'-6"	17.0	1220	2-#7 BARS																	

*[Signature]*  
DIRECTOR, PUBLIC WORKS

5-2-00  
DATE

*[Signature]*  
DEP. DIRECTOR, PUBLIC WORKS

4/12/00  
DATE

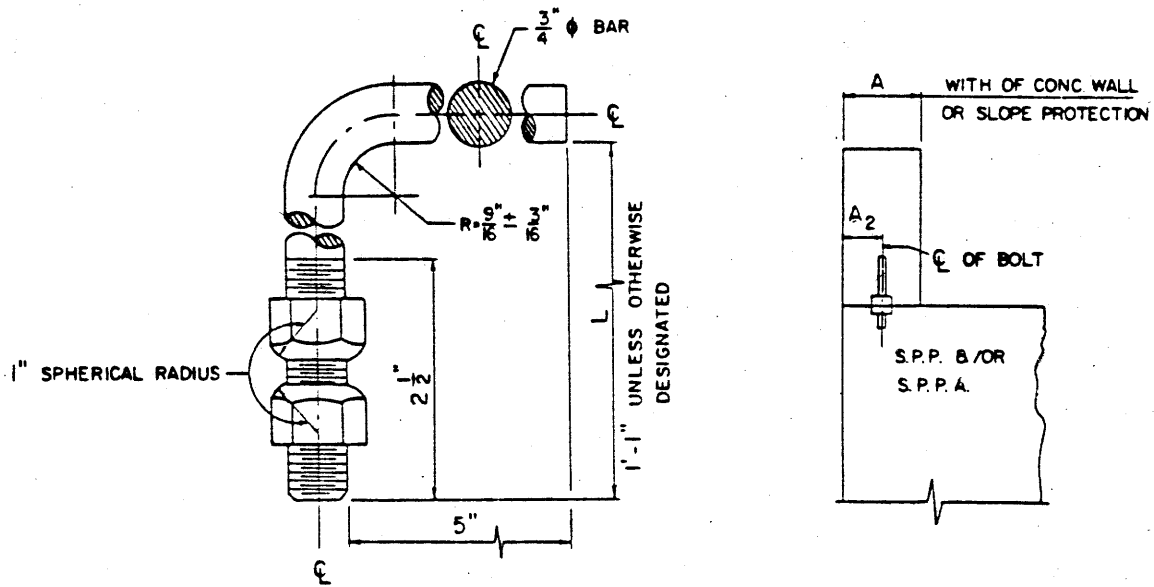


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DEPARTMENT OF  
PUBLIC WORKS

TYPE "A" HEADWALL  
PIPE ARCH  
95"x67"; 106"x73"; 117"x79";  
131"x85"

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-9

*W. Hudson* 5-2-00  
 DIRECTOR OF PUBLIC WORKS. DATE  
*W. Hudson* 4-2-02  
 DEP. DIRECTOR, PUBLIC WORKS DATE



NOTE: PLACE  $\frac{3}{4}$ "  $\phi$  HOOK BOLTS AT 1'-6" C/C AROUND PERIPHERY OF EACH STRUCTURAL PLATE PIPE OR PIPE ARCH\* AT EACH HEADWALL, JUNCTION BOX, B/OR SLOPE PROTECTION AS CASE MAY BE. SET BOLTS IN PIPE (OR PIPE ARCH) AT MID POINT OF WALL OR SLOPE PROTECTION. COST OF ALL BOLTS COMPLETE IN PLACE TO BE INCLUDED IN CONTRACT PRICE BID ON PERTINENT PIPE ITEM. BOLTS & NUTS SHALL BE GALVANIZED AFTER THREADING. THE GALVANIZING ON THE THREADED PORTION SHALL NOT PREVENT TURNING THE NUT BY HAND.

\*ALSO CMP  $\geq$  48" DIAMETER



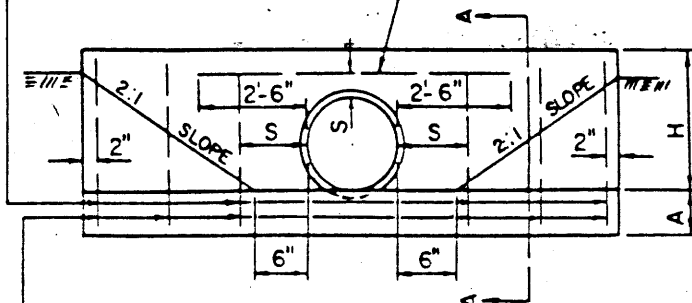
HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

HOOK BOLT DETAIL  
 STR. PLATE PIPE & PIPE ARCHES

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-10

4 #4 STRAIGHT BARS VERTICAL IN FRONT FACE  
FOR 12" TO 18" DIA. PIPE ENDWALLS INCLUSIVE

2 #4 STRAIGHT BARS HORIZONTAL EACH FACE  
FOR 36" DIAMETER TO 60" DIAMETER PIPE  
ENDWALLS INCLUSIVE



4 STRAIGHT BARS VERTICAL @ 1'-6" MIN. TO 2'-0" MAX.  
FRONT FACE FOR 24" DIAMETER TO 60" DIAMETER.  
PIPE ENDWALLS INCLUSIVE.

ELEVATION

4 STRAIGHT BARS HORIZONTAL @ 1'-7" C/C BOTH FACES -  
TOP AND BOTTOM BARS TO BE FULL LENGTH - ALL ENDWALLS.

4 STRAIGHT BARS HORIZONTAL  
@ 1'-0" C/C BOTH SIDES  
OF OPENING FOR 36" TO  
60" DIAMETER PIPE  
ENDWALLS.

1 #4 STRAIGHT BAR  
HORIZONTAL - ALL  
ENDWALLS

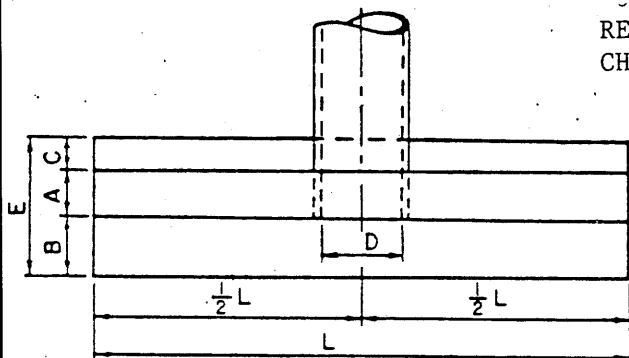
2 #4 STRAIGHT BARS HORIZONTAL  
FOR 36" TO 60" DIAMETER PIPE ENDWALLS.

SECTION A - A

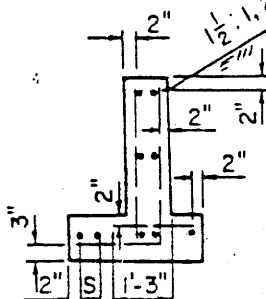
"S" DISTANCES FROM INSIDE SURFACE OF PIPE  
TO VERTICAL BARS IN FRONT AND REAR FACE.  
4" FOR 12" DIAMETER TO 18" DIAMETER PIPES INCLUSIVE  
6" FOR 24" DIAMETER TO 36" DIAMETER PIPES INCLUSIVE  
8" FOR 42" DIAMETER TO 60" DIAMETER PIPES INCLUSIVE

GENERAL NOTES:

REINFORCING: DEFORMED STEEL BARS: #4  $\phi$  BARS  
CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS 4:1 SLOPE  
DIRECTED



PLAN



DISPOSITION OF BARS - DETAIL

QUANTITIES IN TABLE TO BE USED FOR EST. ONLY

OPENINGS		DIMENSIONS							VOLUME	STEEL
D	AREA	A	B	C	E	F	H	L	CONC.	LBS.
INCHES	SQ. FT.								C.Y.	
12	0.79	9"	6"	6"	1'-9"	9"	1'-9"	6'-6"	0.61	38
15	1.23	9"	6"	6"	1'-9"	9"	2'-0"	7'-9"	0.78	55
18	1.78	9"	6"	6"	1'-9"	9"	2'-3"	9'-0"	0.95	62
24	3.14	9"	14"	6"	2'-5"	9"	2'-9"	11'-6"	1.56	91
30	4.91	9"	14"	6"	2'-5"	12"	3'-6"	14'-2"	2.19	136
36	7.07	12"	16"	10"	3'-2"	12"	4'-0"	16'-8"	4.18	222
42	9.62	12"	16"	10"	3'-2"	12"	4'-6"	19'-2"	5.13	265
48	12.57	12"	16"	10"	3'-2"	12"	5'-0"	21'-8"	6.12	326
54	15.90	12"	20"	12"	3'-8"	12"	5'-6"	24'-2"	7.68	384
60	19.64	12"	20"	12"	3'-8"	12"	6'-0"	26'-6"	8.86	428

*[Signature]* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 4/14/00  
DEP. DIRECTOR, PUBLIC WORKS DATE

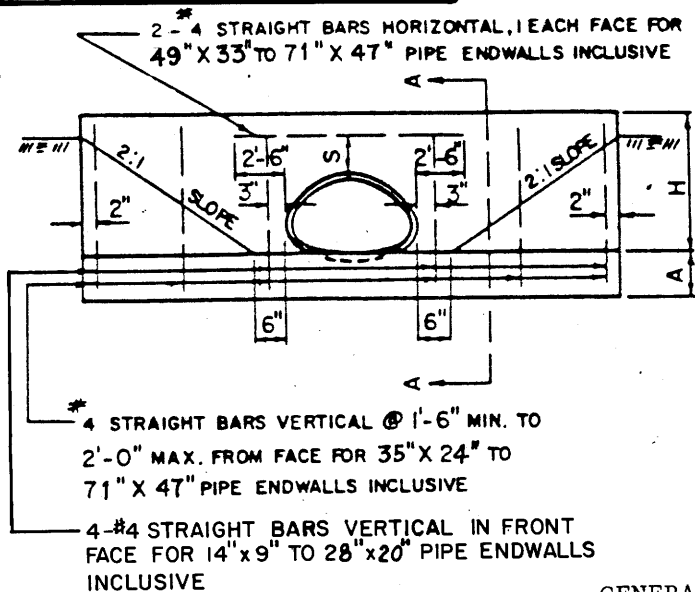


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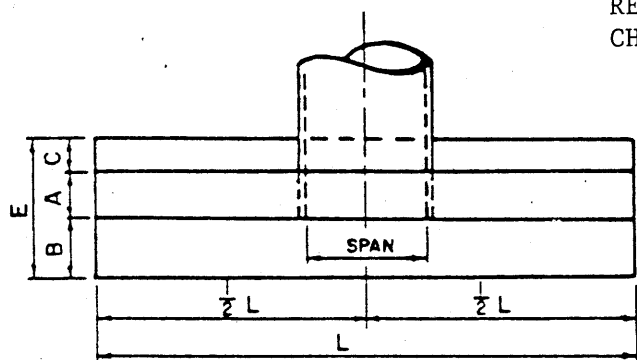
STANDARD TYPE 'C' ENDWALL  
ROUND PIPE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-II

*Alcalá* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*V. Huber* 4/100  
 DEP. DIRECTOR, PUBLIC WORKS DATE



ELEVATION



PLAN

- 4 STRAIGHT BARS HORIZONTAL @ 1'-7" C/C BOTH FACES - TOP & BOTTOM BARS TO BE FULL LENGTH - ALL ENDWALLS.
- 4 BENT BARS @ 1'-0" C/C ALL ENDWALLS.
- 4 STRAIGHT BARS HORIZONTAL @ 1'-0" C/C BOTH SIDES OF OPENING FOR 49" X 33" TO 71" X 47" PIPE ENDWALLS INCLUSIVE
- 1 - 4 STRAIGHT BAR HORIZONTAL ALL ENDWALLS
- 2 - 4 STRAIGHT BARS HORIZONTAL FOR 49" X 33" TO 71" X 47" PIPE ENDWALLS INCLUSIVE

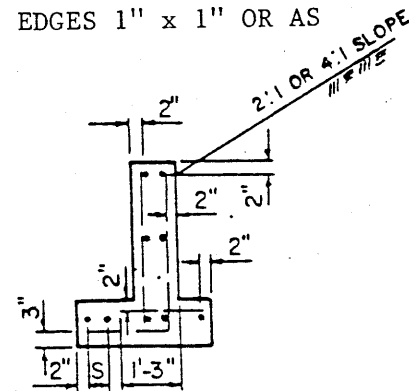
SECTION A - A

"S" DISTANCES

- 4" FOR 14" X 9" TO 21" X 15" INCLUSIVE
- 6" FOR 28" X 20" TO 42" X 29" INCLUSIVE
- 8" FOR 49" X 33" TO 71" X 47" INCLUSIVE

GENERAL NOTES:

REINFORCING: DEFORMED STEEL BARS: #4  $\phi$  BARS  
 CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS DIRECTED



DISPOSITION OF BARS - DETAILS

OPENINGS		DIMENSIONS							VOLUME STEEL	
SIZE	AREA	A	B	C	E	F	H	L	CONC.	LBS.
INCHES	SQ. FT.								C.Y.	
14" X 9"	0.8	9"	6"	6"	1'-9"	8"	1'-5"	6'-4"	.54	41
17" X 13"	1.1	9"	6"	6"	1'-9"	6"	1'-5"	6'-4"	.53	41
21" X 15"	1.6	9"	6"	6"	1'-9"	11"	2'-0"	9'-7"	.95	68
28" X 20"	2.8	9"	6"	6"	1'-9"	6"	2'-0"	9'-7"	.92	67
35" X 24"	4.4	9"	14"	6"	2'-5"	14"	3'-0"	13'-9"	1.95	120
42" X 29"	6.4	9"	14"	6"	2'-5"	9"	3'-0"	13'-9"	1.89	126
49" X 33"	8.7	12"	16"	10"	3'-2"	14"	3'-9"	18'-0"	4.29	226
57" X 38"	11.4	12"	16"	10"	3'-2"	9"	3'-9"	18'-0"	4.19	226
64" X 43"	14.3	12"	20"	12"	3'-8"	13"	4'-5"	21'-10"	6.01	310
71" X 47"	17.6	12"	20"	12"	3'-8"	9"	4'-5"	21'-10"	5.89	310

QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY.



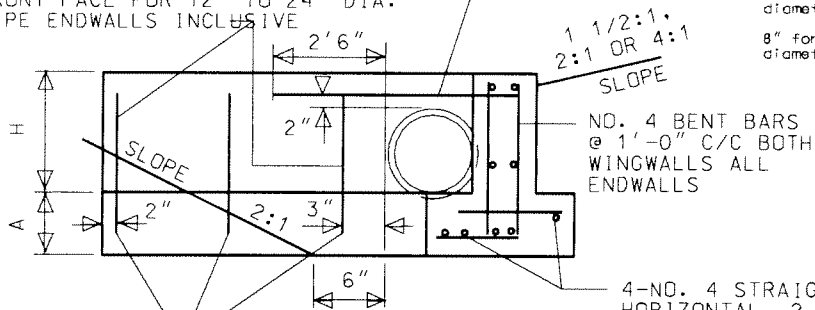
HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

STANDARD TYPE 'C' ENDWALL  
 ARCH PIPE

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-12

2-NO. 4 BENT BARS HORIZONTAL  
1 EACH FACE FOR 36" TO 72"  
DIA. PIPE ENDWALLS INCLUSIVE.

2-NO. 4 STRAIGHT BARS VERTICAL IN  
FRONT FACE FOR 12" TO 24" DIA.  
PIPE ENDWALLS INCLUSIVE

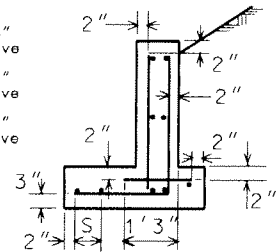


S Distance

4" for 12" to 16"  
diameter inclusive

6" for 24" to 36"  
diameter inclusive

8" for 42" to 60"  
diameter inclusive

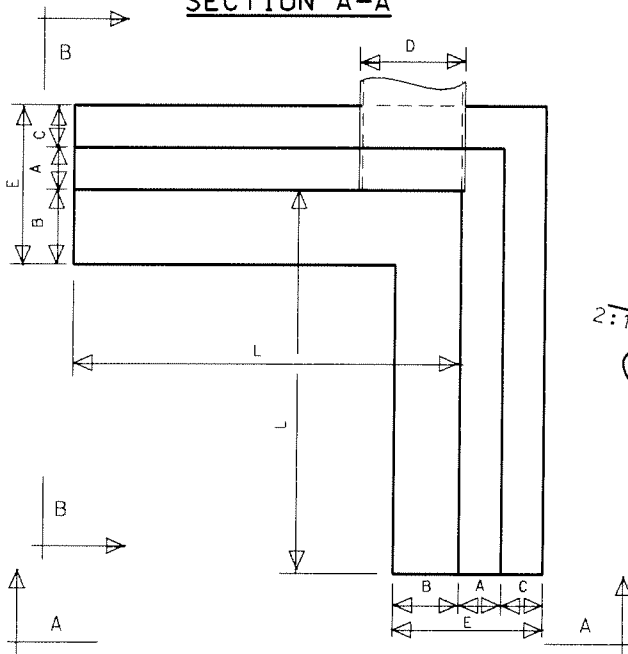


**DISPOSITION OF BARS**

4-NO. 4 STRAIGHT BARS  
HORIZONTAL, 2 EACH  
WINGWALL FOR 36" TO  
72" DIA. PIPE ENDWALL

NO. 4 STRAIGHT BARS VERTICAL  
@ 1'-6" MIN. TO 2'-0" MAX.  
FRONT FACE FOR 12" TO 24"  
DIA. PIPE ENDWALLS INCLUSIVE

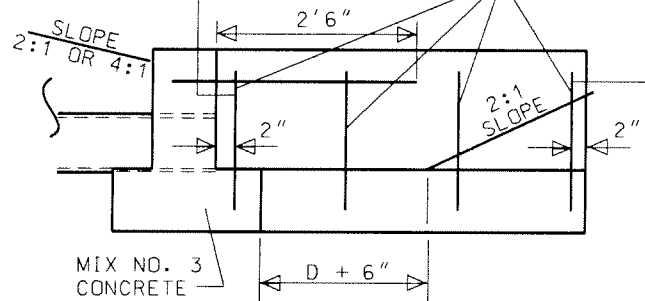
**SECTION A-A**



**PLAN**

2-NO. 4 STRAIGHT BARS VERTICAL  
IN FRONT FACE FOR 12" TO 18"  
DIA. PIPE ENDWALLS - INCLUSIVE

NO. 4 STRAIGHT BARS  
VERTICAL @ 1'-6" MIN.  
TO 2'-0" MAX. FRONT  
FACE FOR 24" TO 60"  
DIA. PIPE ENDWALLS  
INCLUSIVE.



**SECTION B-B**

Openings		Dimensions						Vol.	Steel
D	Area	A	B	C	E	H	L	Conc.	
Inches	Sq. Ft.							C.Y.	Lbs.
12"	0.79	9"	6"	6"	1'9"	1'9"	3'6"	0.73	56
15"	1.23	9"	6"	6"	1'9"	2'0"	4'3"	0.93	77
18"	1.78	9"	6"	6"	1'9"	2'3"	5'0"	1.14	89
24"	3.14	9"	14"	6"	2'5"	2'9"	6'6"	1.8	124
30"	4.91	9"	14"	6"	2'5"	3'6"	8'0"	2.6	160
36"	7.07	12"	16"	10"	3'2"	4'0"	9'6"	5.0	287
42"	9.62	12"	16"	10"	3'2"	4'6"	11'0"	6.2	333
48"	12.57	12"	16"	10"	3'2"	5'0"	12'6"	7.4	387
54"	15.90	12"	20"	12"	3'8"	5'6"	14'0"	9.2	458
60"	19.64	12"	20"	12"	3'8"	6'0"	15'6"	10.7	519

*[Signature]* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE

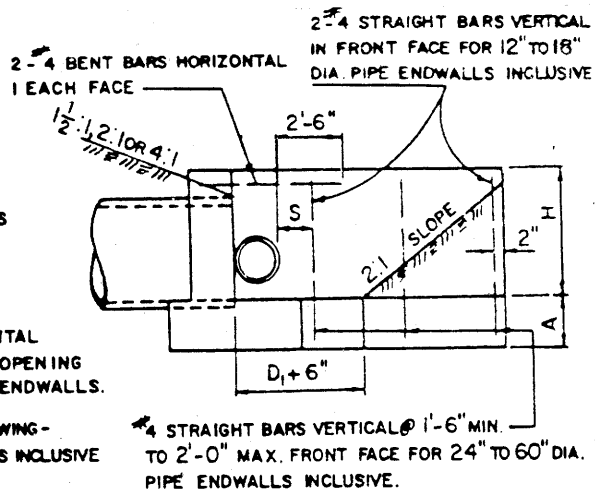
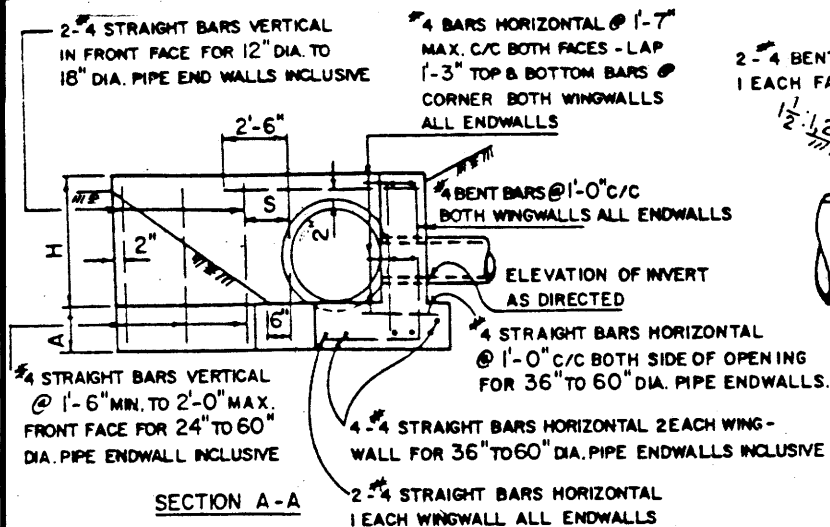


**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**TYPE E ENDWALL**  
**ROUND PIPE**

**ISSUED** \_\_\_\_\_  
**REVISED** \_\_\_\_\_  
**REVISED** \_\_\_\_\_  
**PLATE** D-13

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-14



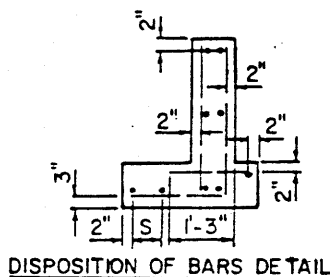
'S' DISTANCES FROM INSIDE SURFACE OF PIPE TO VERTICAL BARS IN FRONT & REAR FACE.  
 4" FOR 12" DIA. TO 18" DIA. PIPES INCLUSIVE  
 6" FOR 24" DIA. TO 36" DIA. PIPES INCLUSIVE  
 8" FOR 42" DIA. TO 48" DIA. PIPES INCLUSIVE

QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

D	D	A	B	C	E	H	L	G	VOL. CONC. C.Y.	STEEL LBS.
12"	12"	9"	6"	6"	1'-9"	1'-9"	3'-6"	1'-6"	0.7	62
15"	12"	9"	6"	6"	1'-9"	2'-0"	4'-3"	2'-0"	0.9	76
15"	15"	9"	6"	6"	1'-9"	2'-0"	4'-3"	2'-0"	0.9	76
18"	12"	9"	6"	6"	1'-9"	2'-3"	5'-0"	2'-3"	1.1	88
18"	15"	9"	6"	6"	1'-9"	2'-3"	5'-0"	2'-3"	1.1	85
18"	18"	9"	6"	6"	1'-9"	2'-3"	5'-0"	2'-3"	1.1	85
24"	12"	9"	14"	6"	2'-5"	2'-9"	6'-6"	3'-0"	1.8	123
24"	15"	9"	14"	6"	2'-5"	2'-9"	6'-6"	3'-0"	1.8	122
24"	18"	9"	14"	6"	2'-5"	2'-9"	6'-6"	3'-0"	1.8	117
24"	24"	9"	14"	6"	2'-5"	2'-9"	6'-6"	3'-0"	1.8	116
30"	12"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.6	172
30"	15"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.6	171
30"	18"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.5	171
30"	24"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.5	166
30"	30"	9"	14"	6"	2'-5"	3'-6"	8'-0"	3'-9"	2.5	164
36"	12"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	5.0	279
36"	15"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	5.0	279
36"	18"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	5.0	274
36"	24"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	4.9	272
36"	30"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	4.9	262
36"	36"	12"	16"	10"	3'-2"	4'-0"	9'-6"	4'-6"	4.8	260
42"	12"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.1	328
42"	15"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.1	328
42"	18"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.1	327
42"	24"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.1	317
42"	30"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	6.0	315
42"	36"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	5.9	308
42"	42"	12"	16"	10"	3'-2"	4'-6"	11'-0"	5'-3"	5.8	307
48"	12"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.4	404
48"	15"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.4	404
48"	18"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.4	393
48"	24"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.3	391
48"	30"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.2	383
48"	36"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.2	381
48"	42"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.1	373
48"	48"	12"	16"	10"	3'-2"	5'-0"	12'-6"	6'-0"	7.0	371

GENERAL NOTES:

REINFORCING: DEFORMED STEEL BARS; #4  $\phi$  BARS  
 CHAMFER: ALL EXPOSED EDGES 1" x 1" OR AS DIRECTED



*W. Hubert Myers, Jr.* 52-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*W. Hubert Myers, Jr.* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

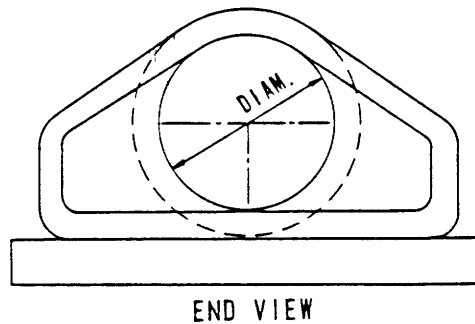
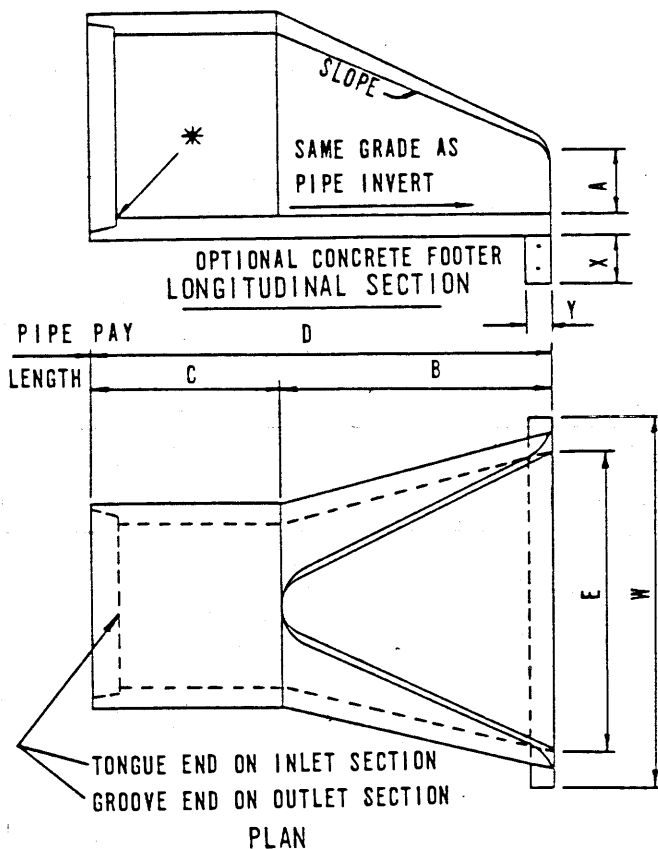


HARFORD COUNTY, MD  
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 PUBLIC WORKS

STANDARD TYPE H ENDWALL  
 ROUND PIPE

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-15





NOTE: CONTRACTOR HAS OPTION OF FURNISHING END SECTIONS CONFORMING TO DETAILS ON THIS SHEET OR END SECTIONS CONFORMING TO DETAILS ON D-17

NOTES:

1. END SECTIONS MUST BE REINFORCED TO CONFORM WITH CLASS IV PIPE.
2. CONCRETE FOOTER SHALL BE USED WHEN SPECIFIED ON THE PLANS. COST OF CONCRETE FOOTER TO BE PAID PER CUBIC YARD OF MIX 2 CONCRETE FOR MISCELLANEOUS STRUCTURES. REINFORCEMENT TO BE #3 BARS.

\*INVERT ELEVATION TO BE AT THE PIPE END OF THE END SECTION. ELEVATIONS TO BE NOTED ON CONSTRUCTION PLANS

TABLE OF DIMENSIONS									
CONCRETE END SECTION							CONCRETE FOOTER		
DIAM.	SLOPE	A	B	C	D	E	W	X	Y
12"	3:1	4"	2'-0"	4'-0 $\frac{1}{2}$ "	6'-0 $\frac{1}{2}$ "	2'-0"	3'-0"	12"	9"
15"	3:1	6"	2'-3"	3'-10"	6'-1"	2'-6"	3'-6"	12"	9"
18"	3:1	9"	2'-3"	3'-10"	6'-1"	3'-0"	4'-0"	12"	9"
21"	3:1	9"	3'-0"	3'-1 $\frac{1}{2}$ "	6'-1 $\frac{1}{2}$ "	3'-6"	4'-6"	12"	9"
24"	3:1	9 $\frac{1}{2}$ "	3'-7 $\frac{1}{2}$ "	2'-6"	6'-1 $\frac{1}{2}$ "	4'-0"	5'-0"	15"	9"
27"	3:1	10 $\frac{1}{2}$ "	4'-1 $\frac{1}{2}$ "	2'-0"	6'-1 $\frac{1}{2}$ "	4'-6"	5'-6"	15"	9"
30"	3:1	1'-0"	4'-6"	1'-7 $\frac{3}{4}$ "	6'-1 $\frac{3}{4}$ "	5'-0"	6'-0"	15"	9"
36"	3:1	1'-3"	5'-3"	2'-10 $\frac{3}{4}$ "	8'-1 $\frac{3}{4}$ "	6'-0"	7'-3"	15"	9"
42"	3:1	1'-6"	5'-3"	2'-11"	8'-2"	6'-6"	7'-9"	15"	9"
48"	3:1	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	8'-6"	18"	12"
54"	2.4:1	2'-3"	5'-5"	2'-9 $\frac{1}{2}$ "	8'-2 $\frac{1}{2}$ "	7'-6"	9'-0"	18"	12"

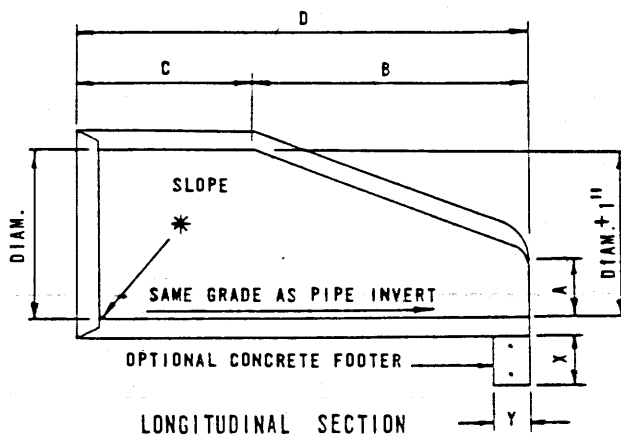
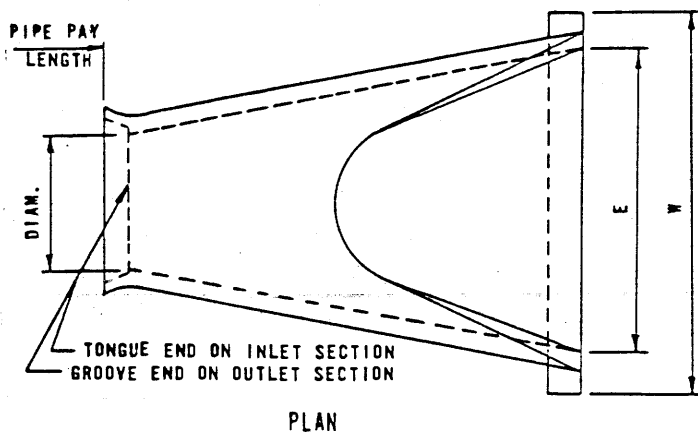
*[Signature]* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

CONCRETE END SECTION  
 ROUND CONCRETE PIPE

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-16



**NOTES:**

1. END SECTIONS MUST BE REINFORCED TO CONFORM WITH CLASS IV PIPE.
2. CONCRETE FOOTER SHALL BE USED WHEN SPECIFIED ON THE PLANS COST OF CONCRETE FOOTER TO BE PAID PER CUBIC YARD OF MIX 2 CONCRETE FOR MISCELLANEOUS STRUCTURES. REINFORCEMENT TO BE #3 BARS.

\* INVERT ELEVATION TO BE AT THE PIPE END OF THE END SECTION. ELEVATIONS TO BE NOTED ON CONSTRUCTION PLANS.

TABLE OF DIMENSIONS									
CONCRETE END SECTION							CONCRETE FOOTER		
DIAM.	SLOPE	A	B	C	D	E	W	X	Y
15"	3:1	6½"	2'-4"	3'-10"	6'-2"	2'-6"	3'-6"	12"	9"
18"	3:1	10¼"	2'-2"	4'-0"	6'-2"	3'-0"	4'-0"	12"	9"
24"	3:1	11"	3'-7"	2'-8"	6'-3"	4'-0"	5'-0"	15"	9"
30"	3:1	1'-1"	4'-5"	1'-10"	6'-5"	5'-0"	6'-0"	15"	9"
36"	3:1	1'-3½"	5'-3"	3'-1"	8'-1½"	6'-0"	7'-3"	15"	9"
42"	3:1	1'-9¼"	5'-5"	2'-10"	8'-3"	6'-6"	7'-9"	15"	9"
48"	3:1	2'-1"	6'-0"	2'-2"	8'-2"	7'-0"	8'-6"	18"	12"
54"	2.4:1	2'-5"	5'-2"	2'-10"	8'-0"	7'-6"	9'-0"	16"	12"
60"	2:1	2'-7"	4'-11"	3'-8½"	8'-7½"	8'-0"	9'-6"	18"	12"
66"	2:1	2'-4"	6'-6"	1'-9"	8'-3"	8'-6"	10'-0"	18"	12"
72"	2:1	2'-10"	6'-6"	1'-9"	8'-3"	9'-0"	10'-9"	18"	12"

- NOTE: CONTRACTOR HAS OPTION OF FURNISHING END SECTIONS CONFORMING TO DETAILS ON THIS SHEET OR END SECTIONS CONFORMING TO DETAILS ON D-16

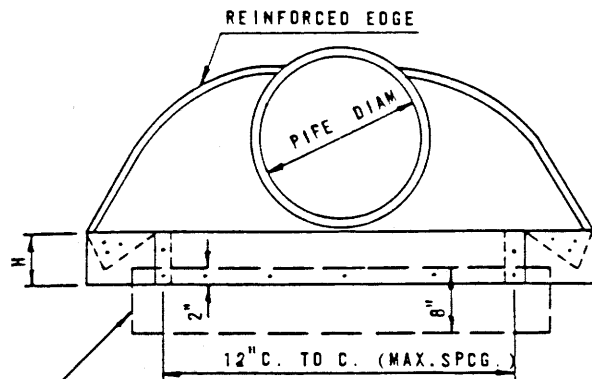
*W. L. Adams, Jr.* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*R. L. Brown, Jr.* 4-1-00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



**HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS**

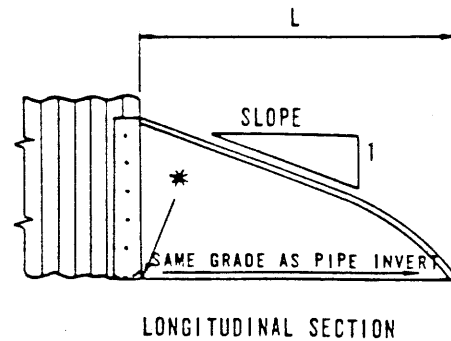
**CONCRETE END SECTION  
 ROUND CONCRETE PIPE**

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
**PLATE D-17**



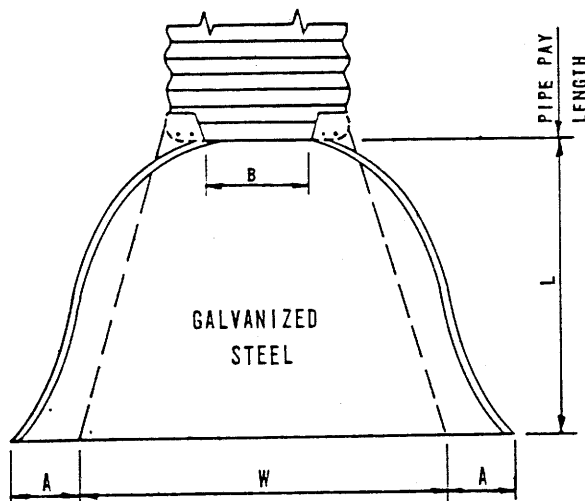
END VIEW

OPTIONAL GALVANIZED  
TOE PLATE (SEE NOTE 3)



LONGITUDINAL SECTION

\* INVERT ELEVATION TO BE AT THE PIPE END  
OF THE END SECTION. ELEVATIONS TO BE  
NOTED ON CONSTRUCTION PLANS.



PLAN

NOTES:

- ALL 3 PIECE BODIES TO HAVE 12 GA. SIDES AND 10 GA. CENTER PANELS. WIDTH OF CENTER PANELS TO BE GREATER THAN 20% OF THE PIPE PERIPHERY. MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED BY  $\frac{3}{8}$ "  $\phi$  GALVANIZED RIVETS OR BOLTS.
- FOR 60" THRU 84" SIZES, REINFORCED EDGES TO BE SUPPLEMENTED WITH GALVANIZED STIFFENER ANGLES. THE ANGLES WILL BE 2"x2" x  $\frac{1}{4}$ " 60" THRU 72" DIAMETER AND 2 $\frac{1}{2}$ "x2 $\frac{1}{2}$ " x  $\frac{1}{4}$ " FOR 78" AND 84" DIAMETER. THE ANGLES TO BE ATTACHED BY  $\frac{3}{16}$ "  $\phi$  GALVANIZED NUTS AND BOLTS.
- TOE PLATE SHALL BE USED WHEN SPECIFIED ON THE PLANS. COST OF TOE PLATE TO BE INCLUDED IN BID PRICE PER EACH OF METAL END SECTION.
- TYPE 3 CONNECTION INCLUDES ONE FOOT OF PIPE LENGTH FOR 42" THRU 84" DIAMETER AS A CONNECTOR SECTION. THE CONNECTOR SECTION WILL BE ATTACHED TO THE END SECTION BY GALVANIZED RIVETS OR BOLTS.

TABLE OF DIMENSIONS

PIPE DIAM.	GA.	A 1 ±	B MAX.	H 1 ±	L 1 ½ ±	W 2 ±	APPROX SLOPE	BODY
12"	16"	6"	6"	6"	21"	24"	2 ½	1 PC
15"	16"	7"	8"	6"	26"	30"	2 ½	1 PC
16"	16"	8"	10"	6"	31"	36"	2 ½	1 PC
21"	16"	9"	12"	6"	36"	42"	2 ½	1 PC
24"	16"	10"	13"	6"	41"	48"	2 ½	1 PC
30"	14"	12"	16"	8"	51"	60"	2 ½	1 PC
36"	14"	14"	19"	9"	60"	72"	2 ½	2 PC
42"	12"	16"	22"	11"	69"	84"	2 ½	2 PC
48"	12"	18"	27"	12"	78"	90"	2 ½	2 PC
54"	12"	18"	30"	12"	84"	102"	2	2 PC
60"	12"	18"	33"	12"	87"	114"	1 ¾	3 PC
66"	12"	18"	36"	12"	87"	120"	1 ½	3 PC
72"	12"	18"	39"	12"	87"	126"	1 ½	3 PC
78"	12"	18"	42"	12"	87"	132"	1 ½	3 PC
84"	12"	18"	45"	12"	87"	138"	1 ½	3 PC

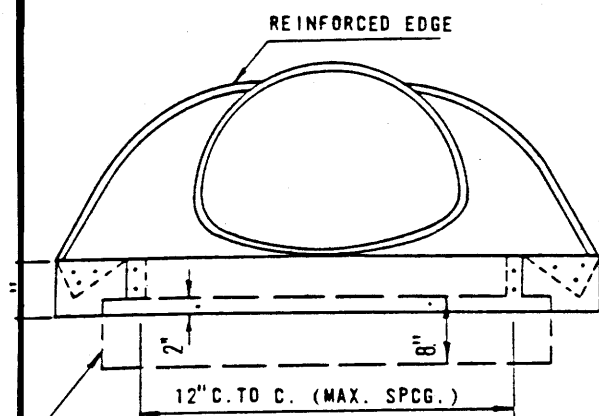


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METAL END SECTION  
ROUND METAL PIPE

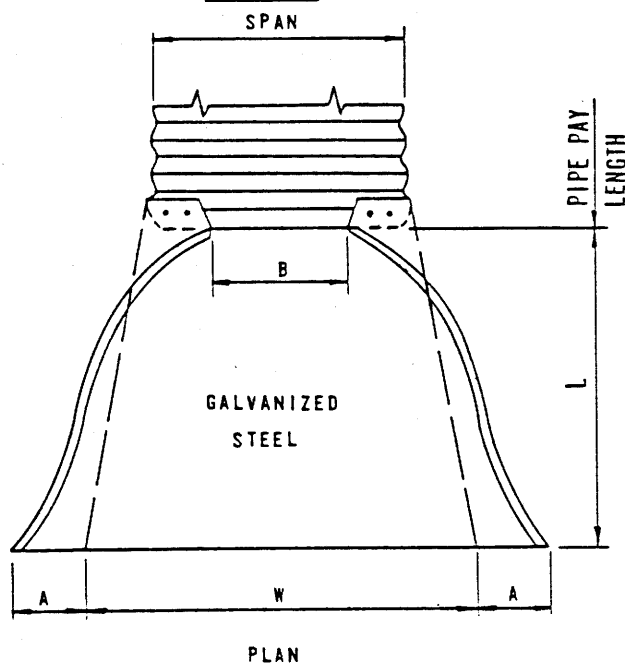
*John A. ...* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*William ...* 4-2-00  
DEP. DIRECTOR, PUBLIC WORKS DATE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-18

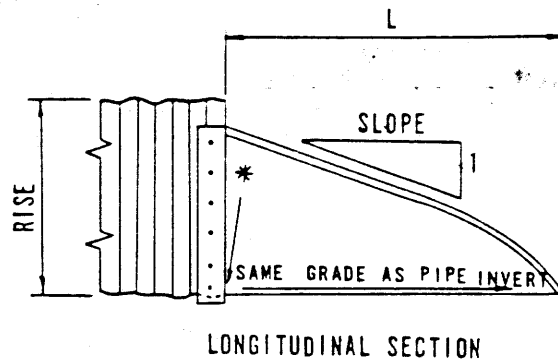


OPTIONAL GALVANIZED TOE PLATE  
(SEE NOTE 4)

END VIEW



PLAN



LONGITUDINAL SECTION

\*INVERT ELEVATION TO BE AT THE PIPE END OF THE  
END SECTION. ELEVATIONS TO BE NOTED ON CONSTRUCTION PLANS.

TABLE OF DIMENSIONS

PIPE ARCH DIMENSION		GA.	A 1" ±	B MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	APPROX SLOPE	BODY
SPAN	RISE								
17"	13"	16"	7"	9"	6"	19"	30"	2 1/4	1 PC
21"	15"	16"	7"	10"	6"	23"	36"	2 1/4	1 PC
24"	18"	16"	8"	12"	6"	26"	42"	2 1/4	1 PC
26"	20"	16"	9"	14"	6"	32"	48"	2 1/4	1 PC
28"	24"	14"	10"	16"	6"	39"	60"	2 1/4	1 PC
42"	29"	14"	12"	18"	8"	46"	75"	2 1/4	1 PC
49"	33"	12"	13"	21"	9"	53"	85"	2 1/4	2 PC
57"	38"	12"	16"	26"	12"	63"	90"	2 1/4	2 PC
64"	43"	12"	16"	30"	12"	70"	102"	2 1/4	2 PC
71"	47"	12"	16"	33"	12"	77"	114"	2 1/4	3 PC
77"	52"	12"	16"	36"	12"	77"	126"	2	3 PC
83"	57"	12"	16"	39"	12"	77"	138"	2	3 PC

NOTES:

1. ALL 3 PIECE BODIES TO HAVE 12 GA. SIDES AND 10 GA. CENTER PANELS  
WIDTH OF CENTER PANELS TO BE GREATER THAN 20% OF THE PIPE PERIPHERY  
MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED  
BY 3/8" Ø GALVANIZED RIVETS OR BOLTS.
2. FOR THE 77" X 52" AND 83" X 57" SIZES, REINFORCED EDGE TO BE SUPPLEMENTED BY  
2" X 2" X 1/4" GALVANIZED ANGLES. THE ANGLES TO BE ATTACHED BY 3/8" Ø GALVANIZED  
NUTS AND BOLTS.
3. ANGLE REINFORCEMENT WILL BE PLACED UNDER THE CENTER PANEL SEAMS ON THE  
77" X 52" AND 83" X 57" SIZES
4. TOE PLATE SHALL BE USED WHEN SPECIFIED ON THE PLANS. COST OF TOE PLATE TO  
BE INCLUDED IN BID PRICE PER EACH OF METAL END SECTION.
5. ALL RODS, BOLTS, NUTS, ETC. TO BE HOT DIP GALVANIZED.
6. SPECIFICATIONS: ASSHO DESIGNATION W36-57.

*[Signature]* 5-2-00  
DIRECTOR OF PUBLIC WORKS. DATE  
*[Signature]* 4-1-00  
DEP. DIRECTOR, PUBLIC WORKS DATE

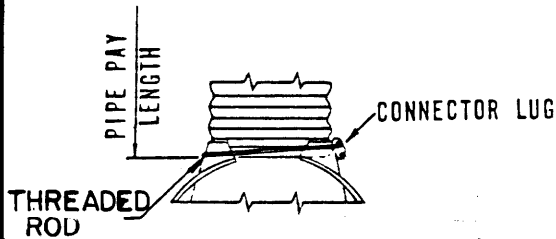


HARFORD COUNTY, MD  
DEPARTMENT OF  
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METAL END SECTION  
ARCH METAL PIPE

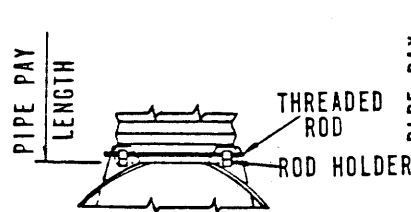
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-19

## CONNECTIONS FOR ROUND PIPE



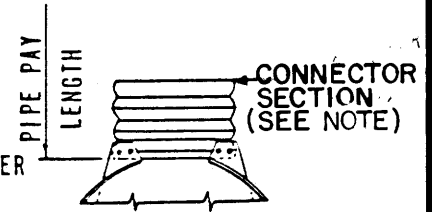
TYPE 1

FOR ONLY 12" THRU 24" ONLY



TYPE 2

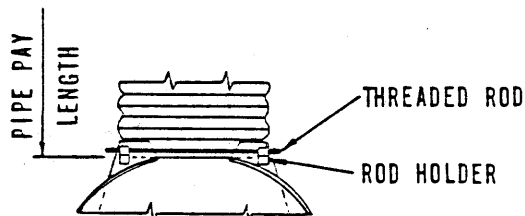
FOR 30" AND 36" ONLY



TYPE 3

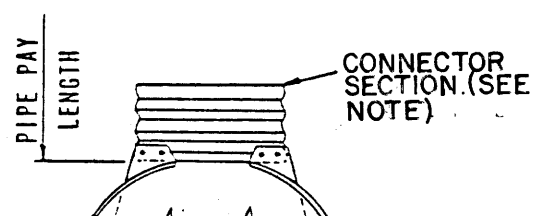
FOR 42" THRU 84" ONLY

## CONNECTIONS FOR ARCH PIPE



TYPE 2

FOR 17"x13" THRU 57"x38" ONLY



TYPE 3

FOR 64"x43" THRU 83"x57" ONLY

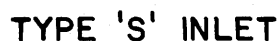
- NOTES: A. TYPE 3 CONNECTION INCLUDES ONE FOOT OF THE PIPE LENGTH FOR 64"x43" THRU 83"x57" ARCH SIZES AND 42" THRU 84" ROUND SIZES AS A CONNECTOR SECTION. THE CONNECTOR SECTION WILL BE ATTACHED TO THE END SECTION BY GALVANIZED RIVETS OR BOLTS.
- B. WHERE END SECTION IS TO BE APPLIED TO A STRUCTURAL PLATE PIPE OR STRUCTURAL PLATE ARCH PIPE THE END SECTION SHALL BE ORDERED WITHOUT THE ONE FOOT OF PIPE LENGTH. INSTEAD, DRILL HOLES AND FIELD BOLT THE END SECTION DIRECTLY TO THE STRUCTURAL PLATE PIPE OR STRUCTURAL PLATE ARCH PIPE.

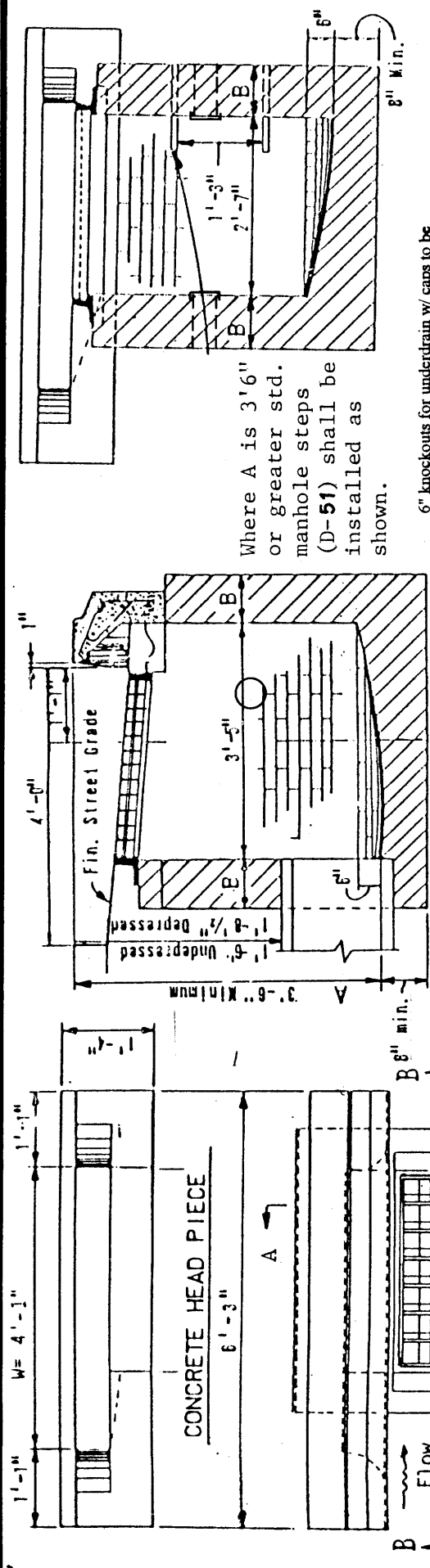


**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**CONNECTIONS**  
**METAL END SECTIONS**

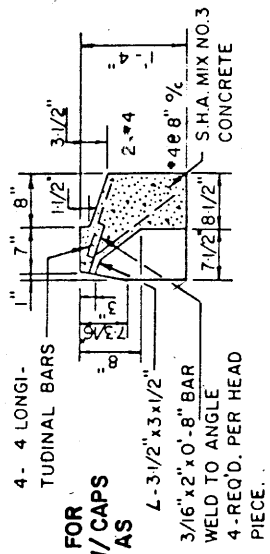
ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-20





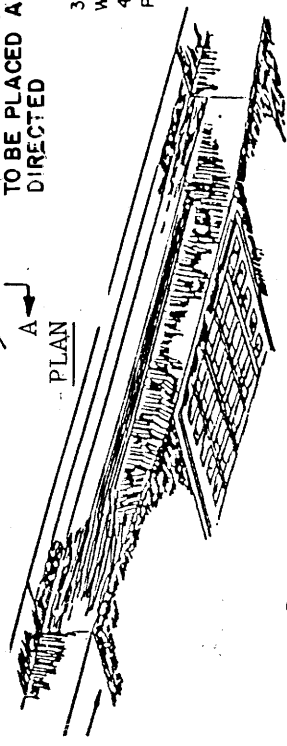
**SECTION A-A**

Provide 1" diameter Weep hole 6" above highest crown of pipe or as directed for brick masonry structure only.



**SECTION C-C**

6" KNOCKOUTS FOR UNDERDRAIN W/ CAPS TO BE PLACED AS DIRECTED



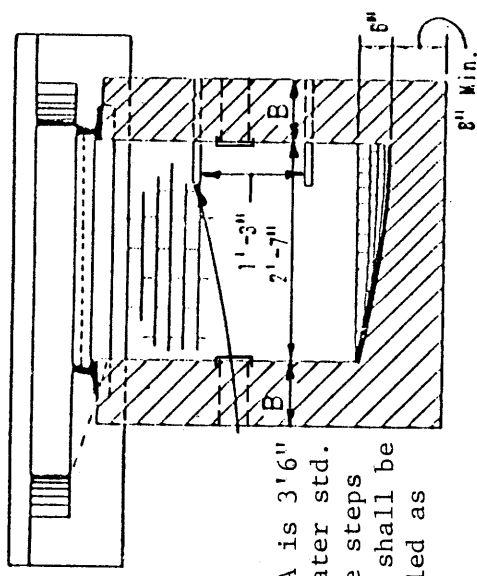
**PERSPECTIVE VIEW**

**NOTE: NO INLETS SHALL BE DEPRESSED**

Where A is 3'6" or greater std. manhole steps (D-51) shall be installed as shown.

6" knockouts for underdrain w/ caps to be placed on all walls of inlet where no pipe is present invert of knockout = highest pipe crown

**SECTION B-B**



**General Notes:**  
 Inlet may be constructed of brick or reinforced concrete. See latest Harford County specifications for inlets. Top 4" of walls may be brick masonry. Additional brick may be used to bring the grate to grade, if required. Reinforcement is required on outside as well as inside, of walls below 7' when A is greater than 7'. Spacing is the same as for inside of wall.  
 Place 1/2" expansion joint material of same type approved for pavement between the frame and abutting rigid pavement and between ends of inlet curb and normal curb.  
 Size, type, and direction of inlet connection will vary to suit conditions.  
 When inlet is used adjacent to curb, slope curb face to meet inside edge of frame, as shown in section B-B.  
 "Brick for Masonry" to comply with latest Harford Co. specs.  
 Inlet to be benched when pipes pass through.  
 Invert may be plain concrete or 4" brick laid on edge.  
 Invert to slope down towards outlet at the rate of 2" per foot, or as directed.  
 Precast inlets must comply with structural requirements of Plate D-27

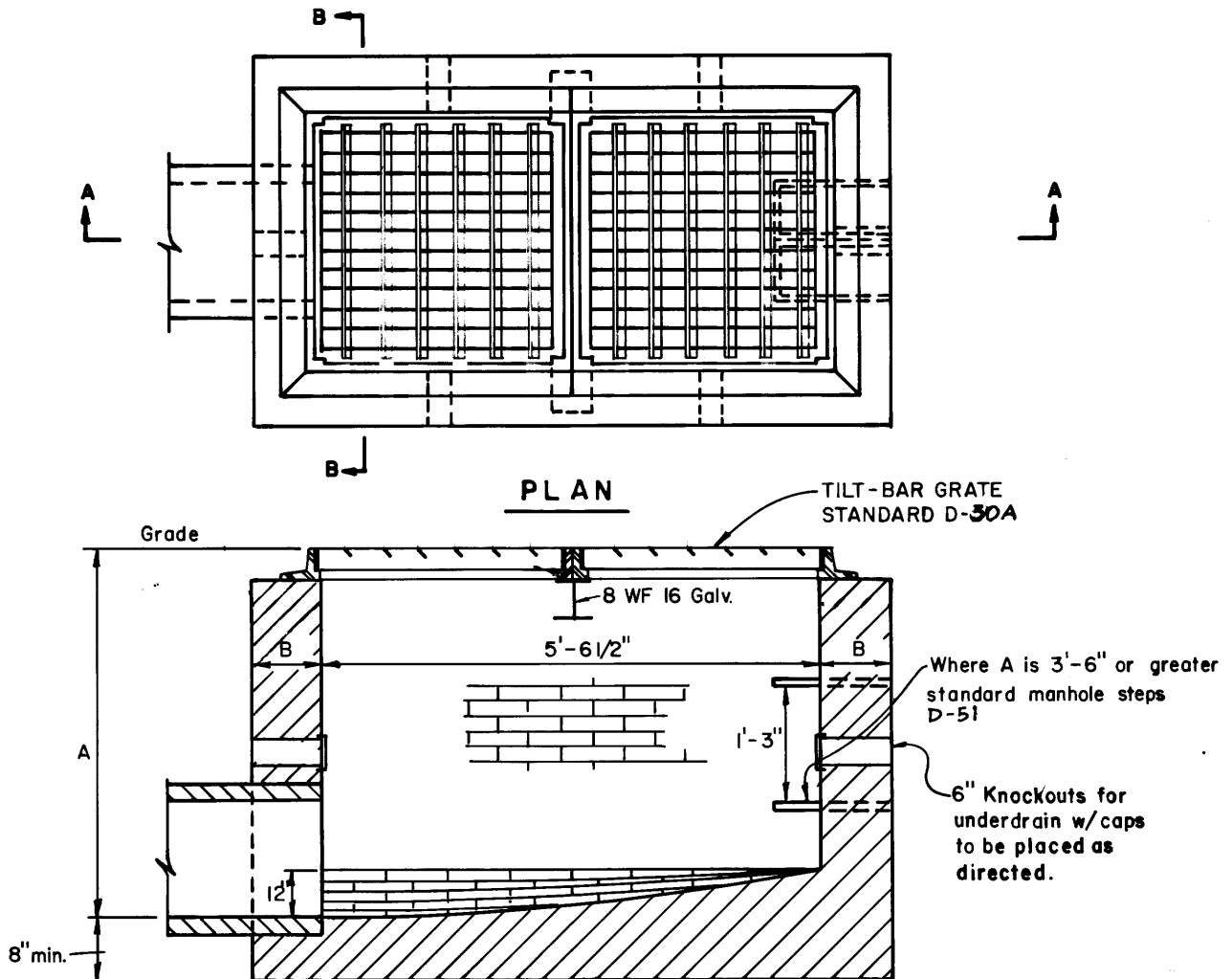


**HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS**

*W. J. [Signature]*  
 DIRECTOR, PUBLIC WORKS  
 DATE *5-2-50*  
*D. Wilson [Signature]*  
 DEP. DIRECTOR, PUBLIC WORKS  
 DATE *11-10-50*

**TYPE 'S'  
 COMBINATION INLET**

**ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-22**



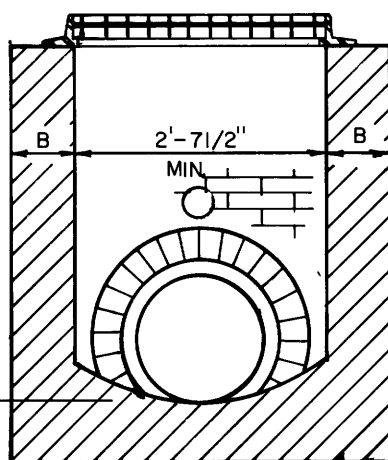
**SECTION "A-A"**

6" knockouts for underdrain w/ caps to be placed on all walls of inlet where no pipe is present invert of knockout = highest pipe crown

**Notes:**

- Invert shall be Brick or 3000 psi Concrete.
- Walls shall be Brick (Br.), 3000 psi Concrete (PC), or Reinforced Concrete (RC). See table for dimensions.
- Reinforcing = #4 at 10" o/c E.W. in  $\frac{1}{2}$  of walls. Reinforcing continuous at corners. All laps 1'-4".
- Top 4" of walls shall be brick masonry. Additional brick shall be used to bring the grate to existing grade if required.
- Where brick is used, invert shall be brick laid on edge.
- Bench (as per Type A manhole) shall be built into inlet where drains run through inlet.
- Precast inlets shall meet the structural requirements of Plate D-29

A	B	Walls
< 6'	8"	Br. or PC
6' to 10'	12"	Br. or PC
6' to 15'	8"	RC *



**SECTION "B-B"**

Provide 1" diameter Weep hole 6" above highest crown of pipe or as directed for brick masonry structure only.

*W. J. Allen, Jr.* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*W. J. Allen, Jr.* 4/2/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

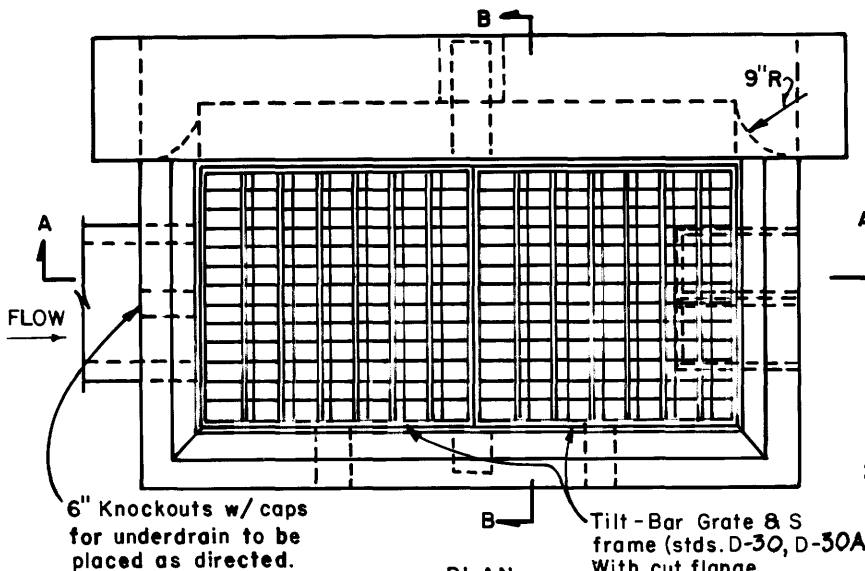


**HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS**

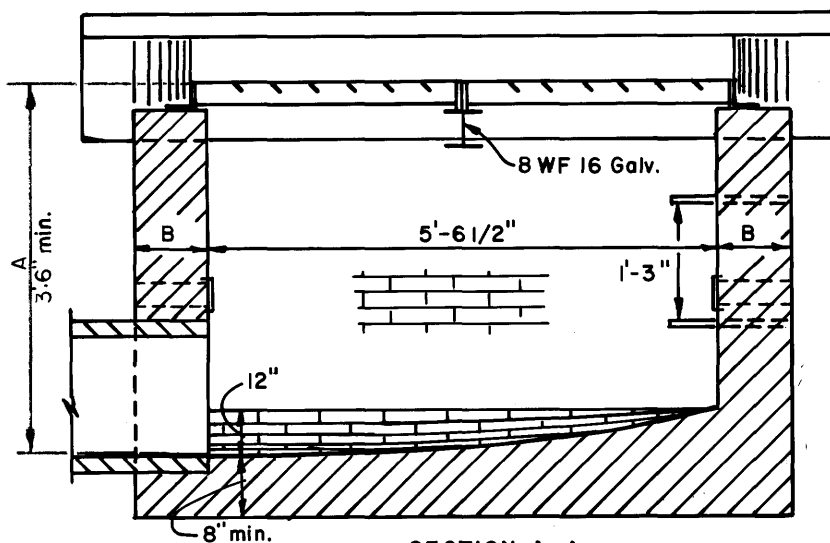
**DOUBLE TYPE 'S' INLET**

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
**PLATE D-23**

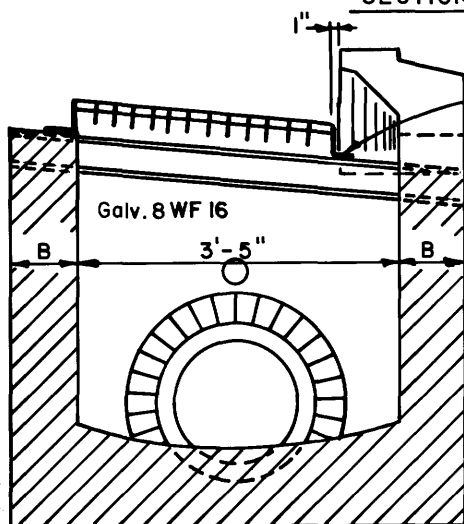




PLAN



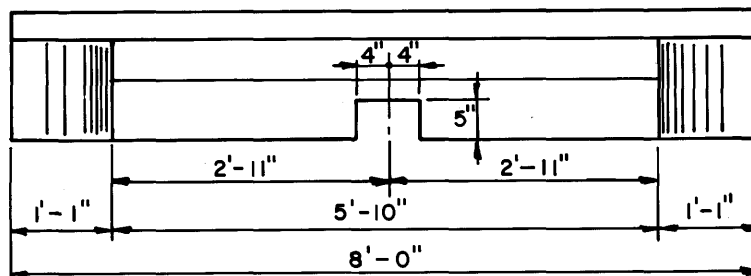
SECTION A-A



SECTION B-B

Provide 1" diameter Weep hole 6" above highest crown of pipe or as directed for brick masonry structure only.

3" x 2 1/2" x 1/2" L5" long galv.



ELEVATION - HEADPIECE

6" knockouts for underdrain w/ caps to be placed on all walls of inlet where no pipe is present invert of knockout = highest pipe crown

NOTES:

1. Invert shall be brick or 3000p.s.i. concrete.
2. Walls shall be Brick (Br.), 3000p.s.i. concrete (P.C.), or Reinforced Concrete (R.C.). See table for dimensions.

A	B	Walls
< 5'	8"	Br. or P.C.
5' to 9'	12"	Br. or P.C.
5' to 14'	8"	R.C.*

3. \*Reinforcing = #4 at 10"  $\phi$  E.W. in  $\ell$  of walls. Reinforcing continuous at corners. All laps 1'-4".
4. Top 4" of walls shall be brick masonry. Additional brick shall be used to bring the grate to existing grade if required.
5. Where brick is used, invert shall be brick laid on edge.
6. Inlet to be benched when pipes pass thru.
7. Where A is 3'-6" or greater, standard manhole steps to be installed as shown.
8. For headpiece detail see D-22.
9. Precast inlets shall meet the structural requirements of Plate D-29.

DIRECTOR OF PUBLIC WORKS

DEP. DIRECTOR, PUBLIC WORKS

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-24



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

DOUBLE TYPE 'S' COMB. INLET

RESERVED FOR FUTURE USE

DIRECTOR OF PUBLIC WORKS      DATE

DEP. DIRECTOR, PUBLIC WORKS      DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-25

A

6" Knockouts for underdrain w/caps to be placed as directed

FLOW

NOTES:

1. See detail D-22 perspective view, headpiece details and inlet cross section.
2. Slab and invert — brick or 3000 p.s.i. concrete.
3. Walls shall be brick (Br.), 3000 p.s.i. concrete (PC), or reinforced concrete (RC). See table for dimensions.

A	B	Walls
< 5'	8"	Br. or PC
5' to 9'	12"	Br. or PC
5' to 14'	8"	RC*

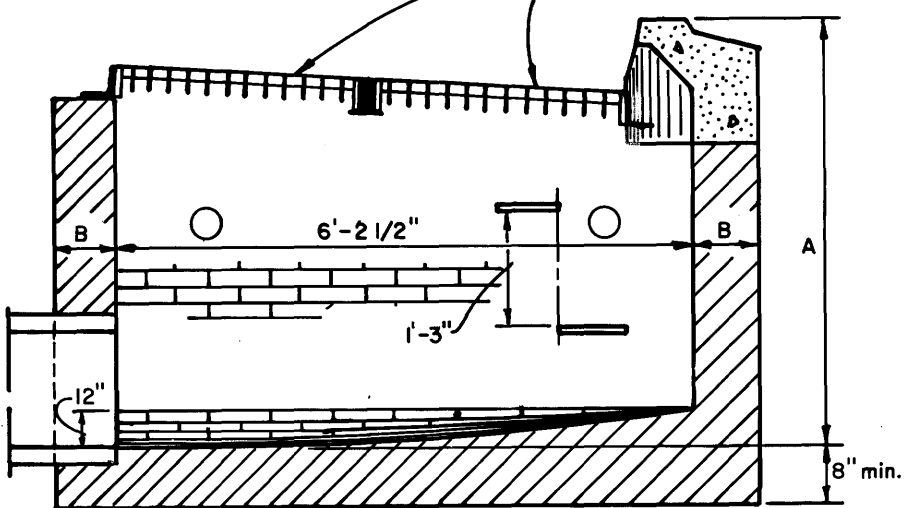
- 4.\* Reinforcing = #4 at 10"  $\phi$  E.W. in  $\ell$  of walls. Reinforcing continuous at corners. All laps 1'-4".
5. Top 4" of walls shall be brick masonry. Additional brick shall be used to bring the grate to existing grade if required.
6. Where brick is used, invert shall be brick laid on edge.
7. Where A is 3'-6" or larger, standard manhole steps shall be installed as shown.

Provide 1" diameter Weep hole 6" above highest crown of pipe or as directed for brick masonry structure only.

6" knockouts for underdrain w/ caps to be placed on all walls of inlet where no pipe is present invert of knockout = highest pipe crown

PLAN

Tilt bar grate D-30A



SECTION 'A-A'

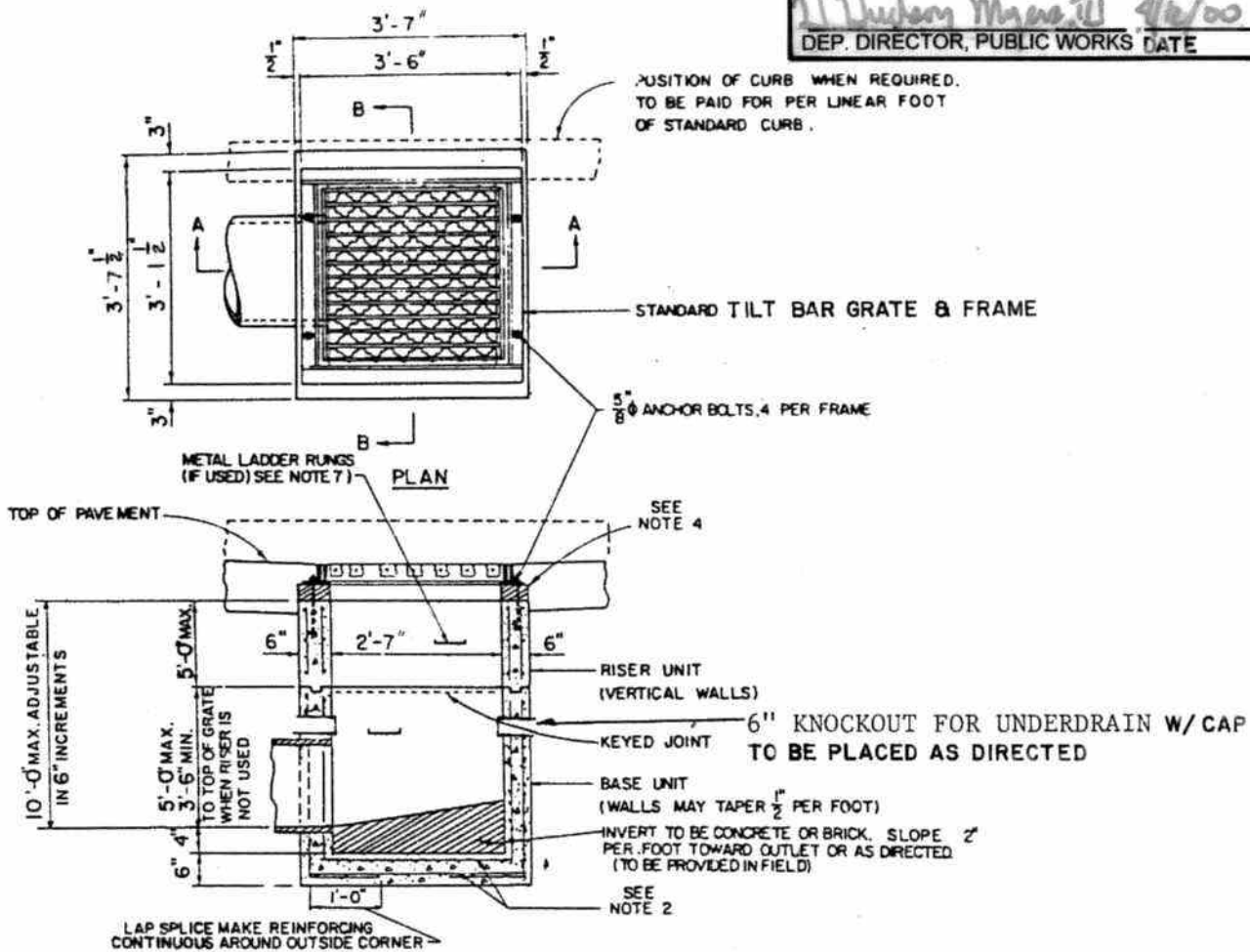
*W. Hubert Myers, III* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*W. Hubert Myers, III* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



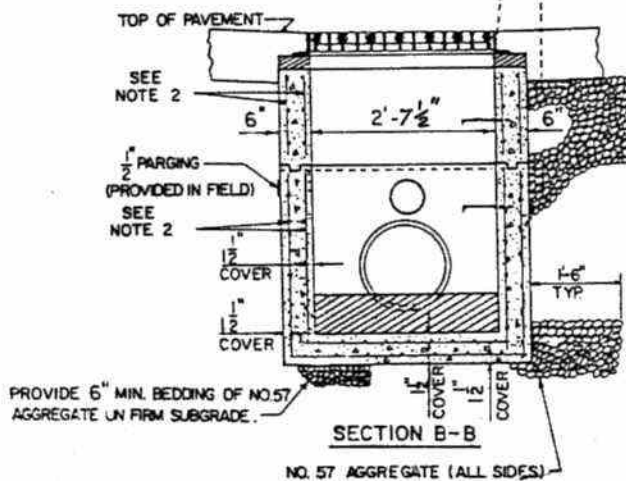
HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

DOUBLE TYPE 'S' COMB. INLET  
 PERPENDICULAR TO CURB

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-26



**SECTION A-A**



### GENERAL NOTES

1. CONCRETE TO BE MIX NO.6 (4500PSI).
2. REINFORCING-2 LAYERS OF 4X4-W 40 X W 40 B6" / □ FT. WELDED WIRE FABRIC.
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. GRADE AND SLOPE ADJUSTMENTS COMPLETED IN FIELD USING CONCRETE MIX NO.6 OR BRICK AND MORTAR.
5. PIPE OPENINGS TO BE PROVIDED AS REQUIRED, FOR SIZE, LOCATION AND INVERT ELEVATIONS REFER TO CONSTRUCTION PLANS.
6. PLACEMENT OF SUBGRADE DRAINAGE WILL BE AS DIRECTED BY THE ENGINEER OR AS NOTED ON THE CONSTRUCTION PLANS.
7. LADDER RUNGS SHALL BE IN ACCORDANCE WITH STANDARD AS SHOWN, OR AS DIRECTED BY THE ENGINEER.
8. MINIMUM DEPTH PAYMENT PER EACH INLET INCLUDES DEPTHS UP TO 3'-6". VERTICAL DEPTH PAYMENT PER LINEAR FOOT INCLUDES DEPTHS IN EXCESS OF 3'-6".
9. A 6" PERFORATED CIRCULAR PIPE, FOR EROSION AND SEDIMENT CONTROL, SHALL BE PLACED IN THE INLET WALL AT ALL INLET SEDIMENT TRAPS AS SHOWN ON THE PLANS.

**Provide 1" diameter Weep hole 6" above highest crown of pipe on all four sides for brick masonry structure only.**



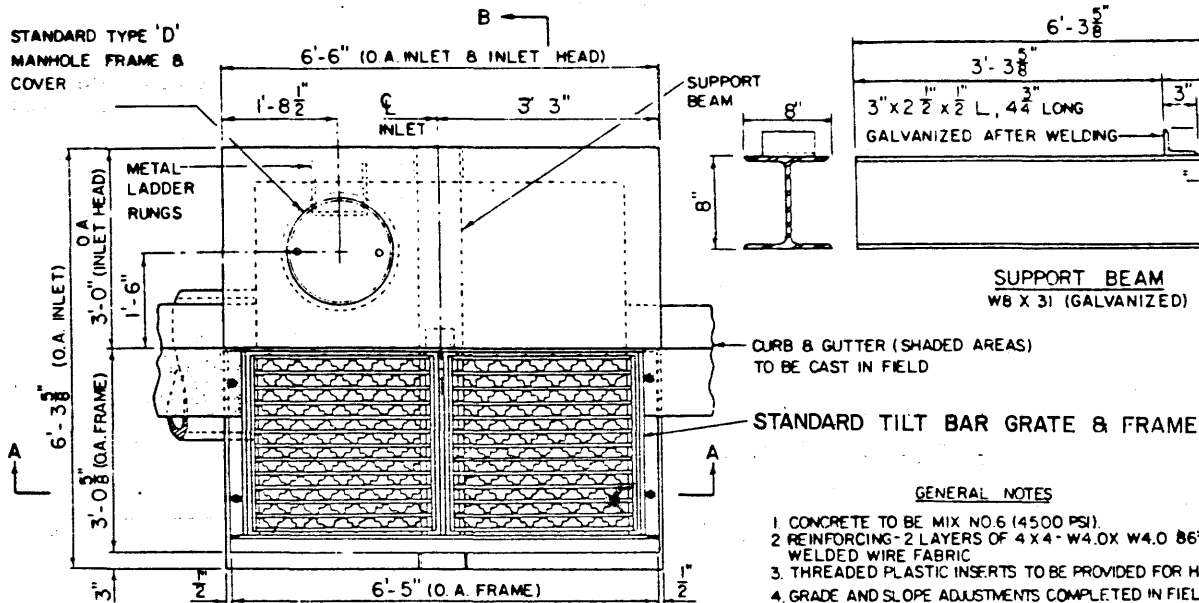
**HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS**

## STRUCTURAL REQUIREMENTS

### PRECAST SINGLE TYPE 'S' & COMBINATION TYPE 'S' INLET

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
**PLATE D27**

STANDARD TYPE 'D'  
MANHOLE FRAME &  
COVER



SUPPORT BEAM  
WB X 31 (GALVANIZED)

CURB & GUTTER (SHADED AREAS)  
TO BE CAST IN FIELD

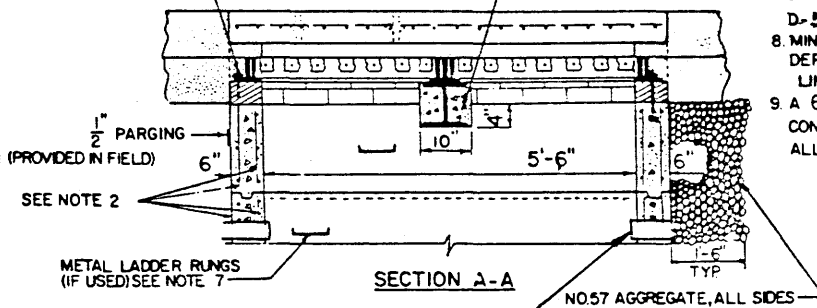
STANDARD TILT BAR GRATE & FRAME

#### GENERAL NOTES

1. CONCRETE TO BE MIX NO. 6 (4500 PSI).
2. REINFORCING- 2 LAYERS OF 4 X 4 - W4.0 X W4.0 @ 6" / 12" FT. WELDED WIRE FABRIC
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. GRADE AND SLOPE ADJUSTMENTS COMPLETED IN FIELD USING CONCRETE MIX NO. 6 OR BRICK AND MORTAR.
5. PIPE OPENINGS TO BE PROVIDED AS REQUIRED, FOR SIZE, LOCATION AND INVERT ELEVATIONS REFER TO CONSTRUCTION PLANS.
6. PLACEMENT OF SUBGRADE DRAINAGE WILL BE AS DIRECTED BY THE ENGINEER OR AS NOTED ON THE CONSTRUCTION PLANS.
7. LADDER RUNGS SHALL BE IN ACCORDANCE WITH STANDARD D-51 AS SHOWN, OR AS DIRECTED BY THE ENGINEER.
8. MINIMUM DEPTH PAYMENT PER "EACH" INLET INCLUDES DEPTHS UP TO 3'-6" VERTICAL DEPTH PAYMENT PER LINEAR FOOT INCLUDES DEPTHS IN EXCESS OF 3'-6"
9. A 6" PERFORATED CIRCULAR PIPE, FOR EROSION AND SEDIMENT CONTROL, SHALL BE PLACED IN THE INLET WALL AT ALL INLET SEDIMENT TRAPS AS SHOWN ON THE PLANS.

5/8" ANCHOR BOLT,  
4 PER FRAME  
(FOR DETAIL SEE  
STANDARD D-30A)

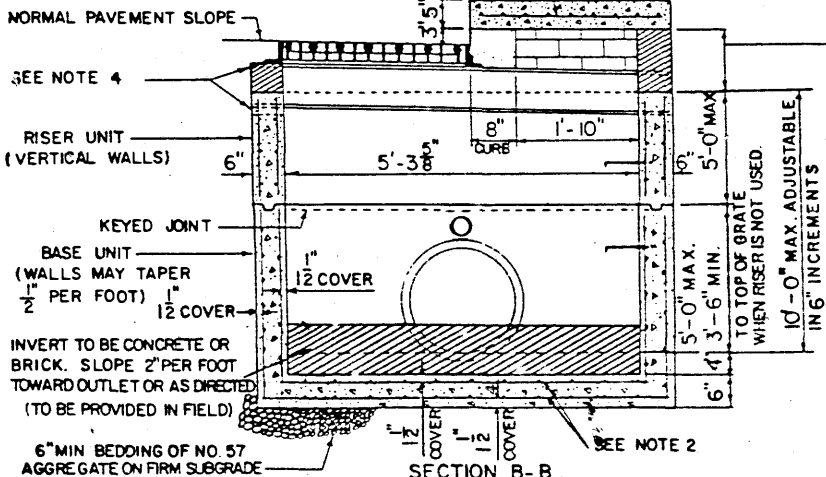
PLAN  
SEE NOTE 4



6" KNOCKOUT FOR UNDER  
DRAIN W/ CAP TO BE  
PLACED AS DIRECTED

PRECAST INLET HEAD

1 LAYER OF 4 X 4 - W4.0 X W4.0 @ 6" / 12" FT. WELDED WIRE FABRIC.



THIS PORTION OF INLET SHALL BE PROVIDED IN THE FIELD AND SHALL BE CONSTRUCTED OF BRICK MASONRY OR REINFORCED CONCRETE MIX NO. 6. "BRICK FOR MASONRY" TO COMPLY WITH LATEST SPECIFICATIONS.

Provide 1" diameter Weep hole 6" above  
highest crown of pipe on all four sides  
for brick masonry structure only.

SECTION B-B

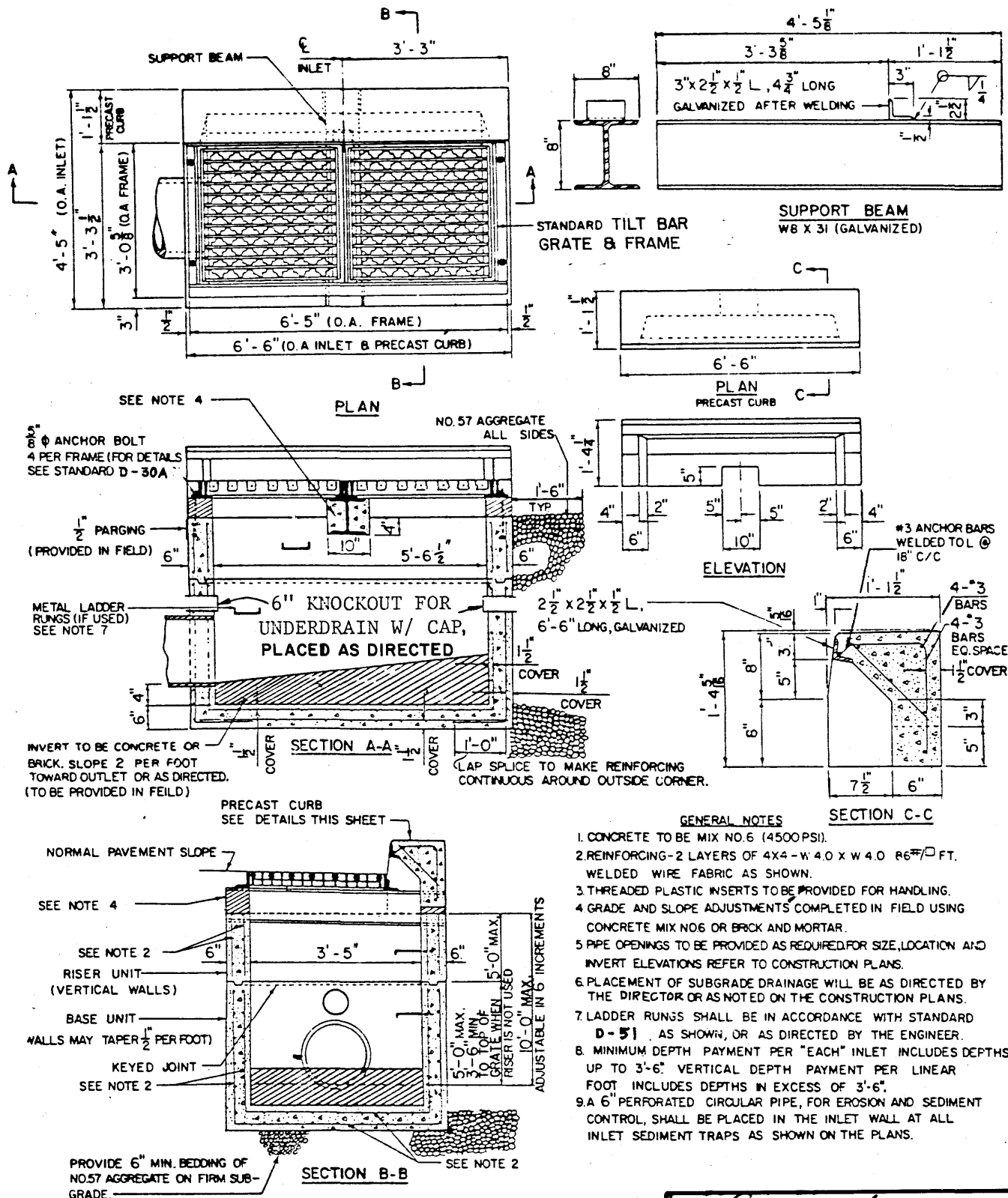
STRUCTURAL REQUIREMENTS  
PRECAST TYPE 'S'  
TYPE 'S' COMBINATION INLET

*[Signature]* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D 28



Provide 1" diameter Weep hole 6" above highest crown of pipe on all four sides for brick masonry structure only.

*W. Jackson* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. Jackson* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**STRUCTURAL REQUIREMENTS**  
**PRECAST DOUBLE TYPE 'S' &**  
**DOUBLE TYPE 'S' COMBINATION INLETS**

**ISSUED** \_\_\_\_\_  
**REVISED** \_\_\_\_\_  
**REVISED** \_\_\_\_\_  
**PLATE D29**

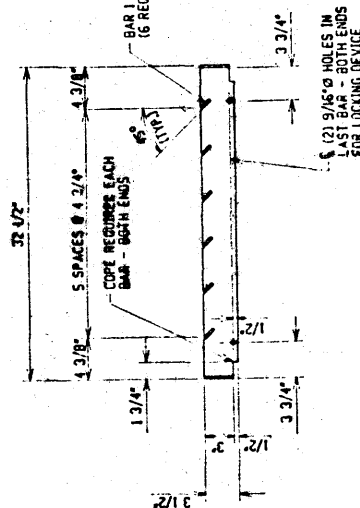
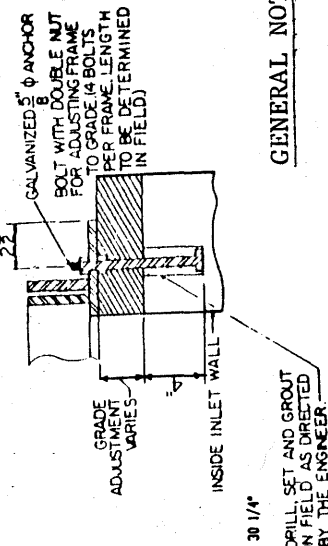
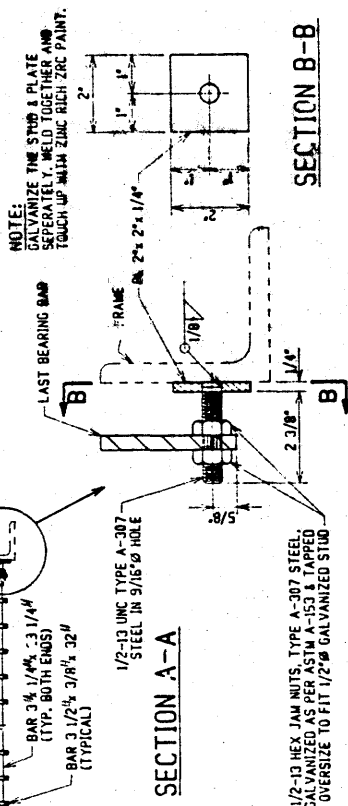
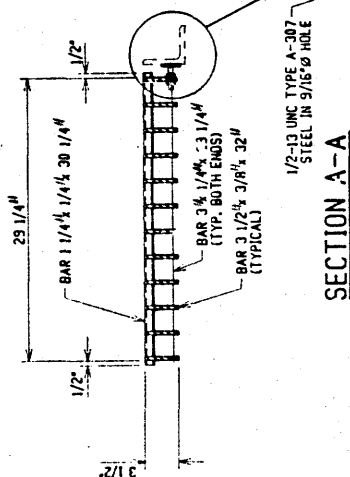
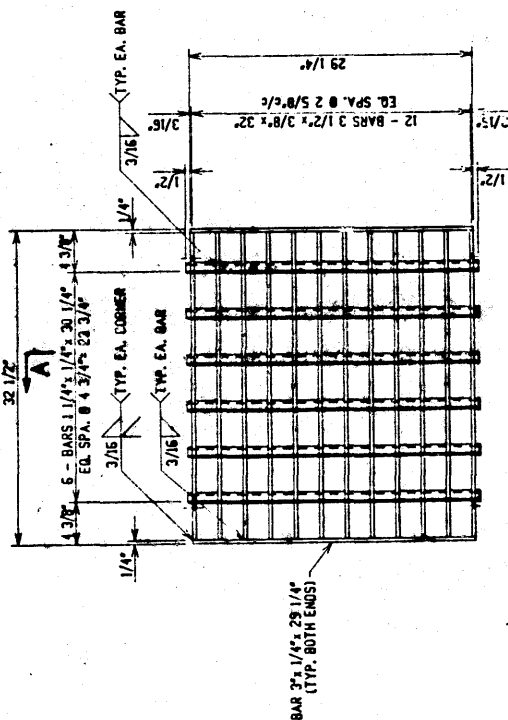


SECTION B-B

SECTION C-C

2-14-69 5-20-69  
 DIRECTOR OF PUBLIC WORKS DATE  
 7-2-69 4/12/69  
 DEP. DIRECTOR, PUBLIC WORKS DATE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-30



FRONT ELEVATION

**GENERAL NOTES:**

1. GRATES TO BE SQUARE, FLAT AND TRUE.
2. STRUCTURAL STEEL SHALL BE ASTM A-36.
3. GRATES TO BE GALVANIZED AFTER FABRICATION

IN ACCORDANCE WITH ASTM A-123.

**SECTION B-B**

**LOCKING DEVICE**  
(2 REQUIRED PER GRATE)

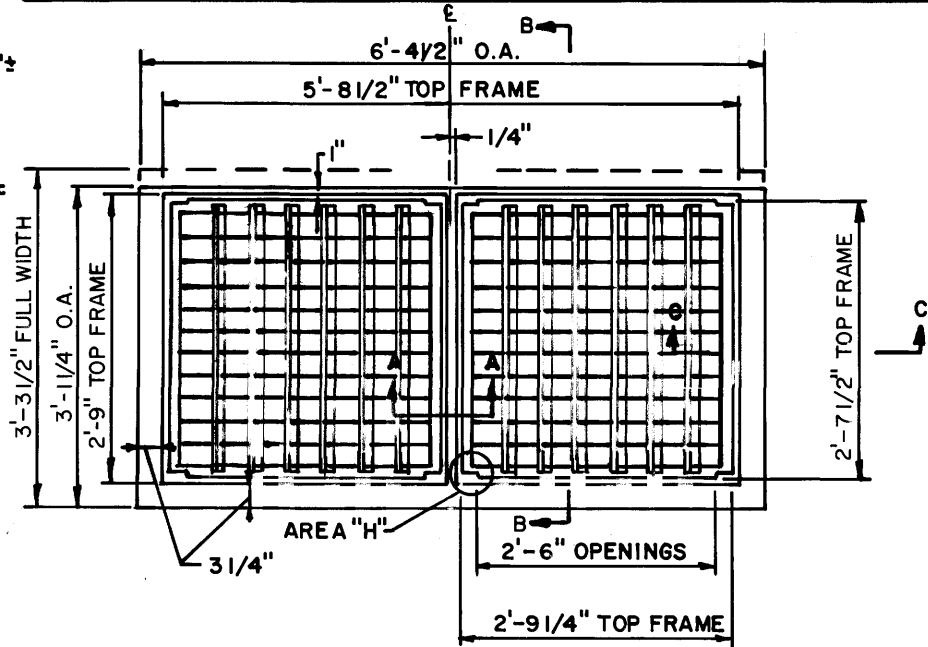
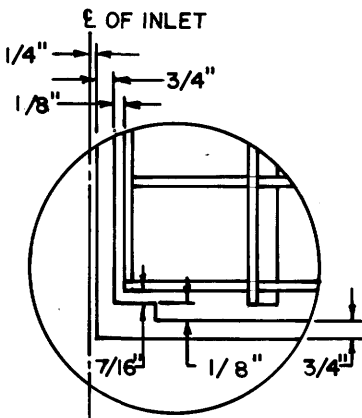
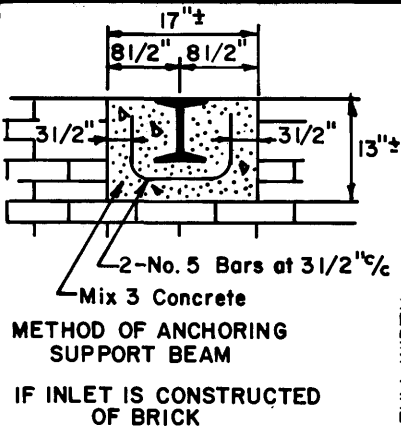
**HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS**

TILT BAR GRATE

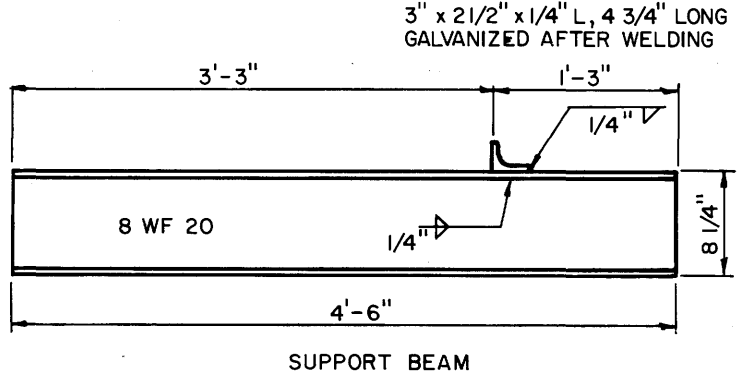
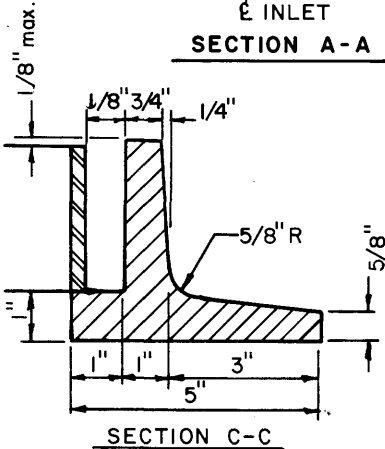
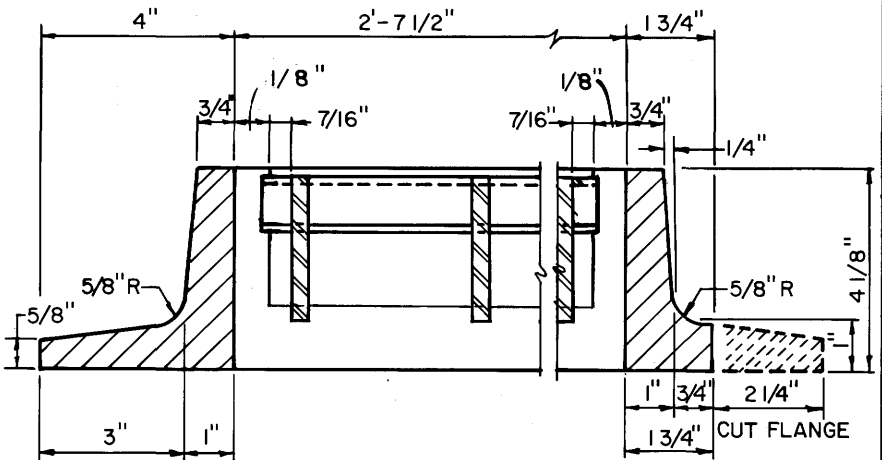
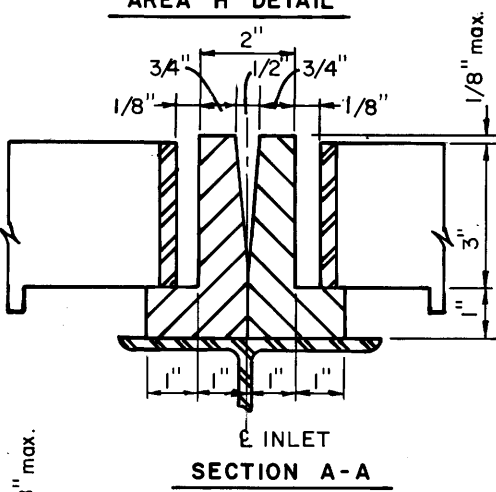
## STANDARD 'S' SIZE

ISSUED.  
REVISED  
REVISED  
PLATE





**NOTE: CASTING MATERIALS SHALL BE GALVANIZED STEEL.**



3" x 2 1/2" x 1/4" L, 4 3/4" LONG GALVANIZED AFTER WELDING

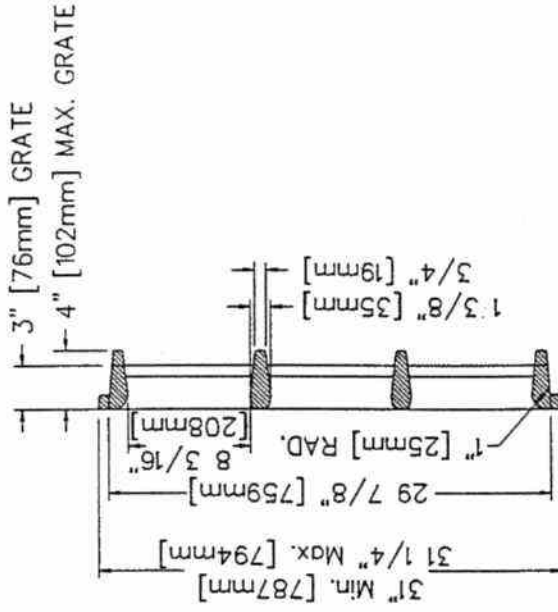
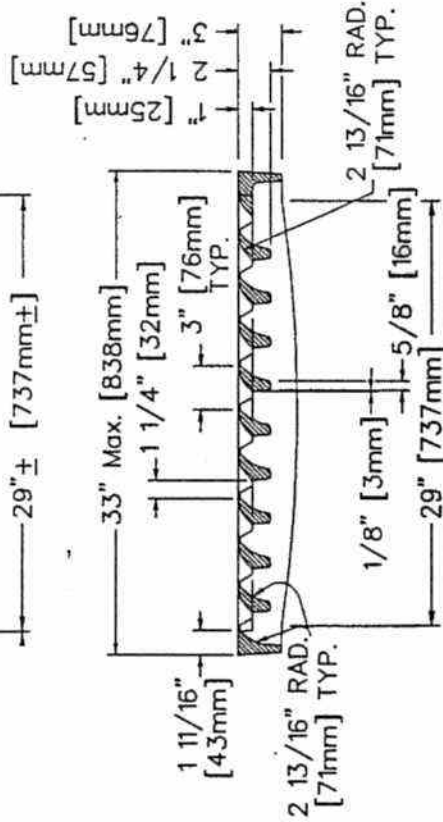
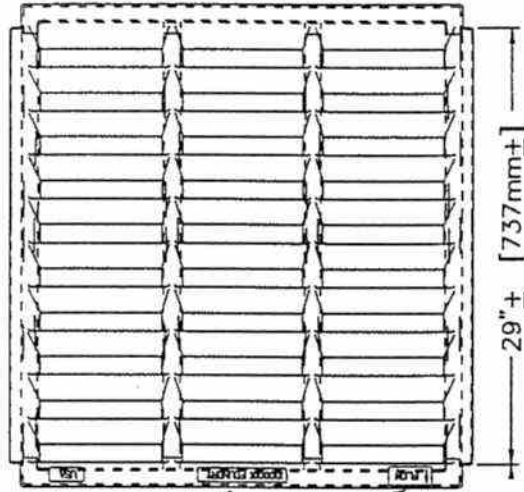


**HARFORD COUNTY, MD**  
**DEPARTMENT OF PUBLIC WORKS**

**FRAME & GRATE**  
**DOUBLE 'S' INLET & COMBO.**

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
**PLATE D-31**

PROVIDE FOUNDRY NAME & FLOW DIRECTION  
AS SHOWN IN 1/2" ± [13 mm] LETTERS



NOTE: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC].  
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B  
WEIGHT: GRATE APPROX. 338#  
GRATE SHALL SIT SQUARE UPON FRAME SUPPORTS WITHOUT  
ROCKING OR SHIFTING UNDER LOAD. GRATE SHALL MEET OR  
EXCEED AASHTO HS20 LOAD STANDARDS.  
FRAME: PER DETAIL D-30 AND D-31

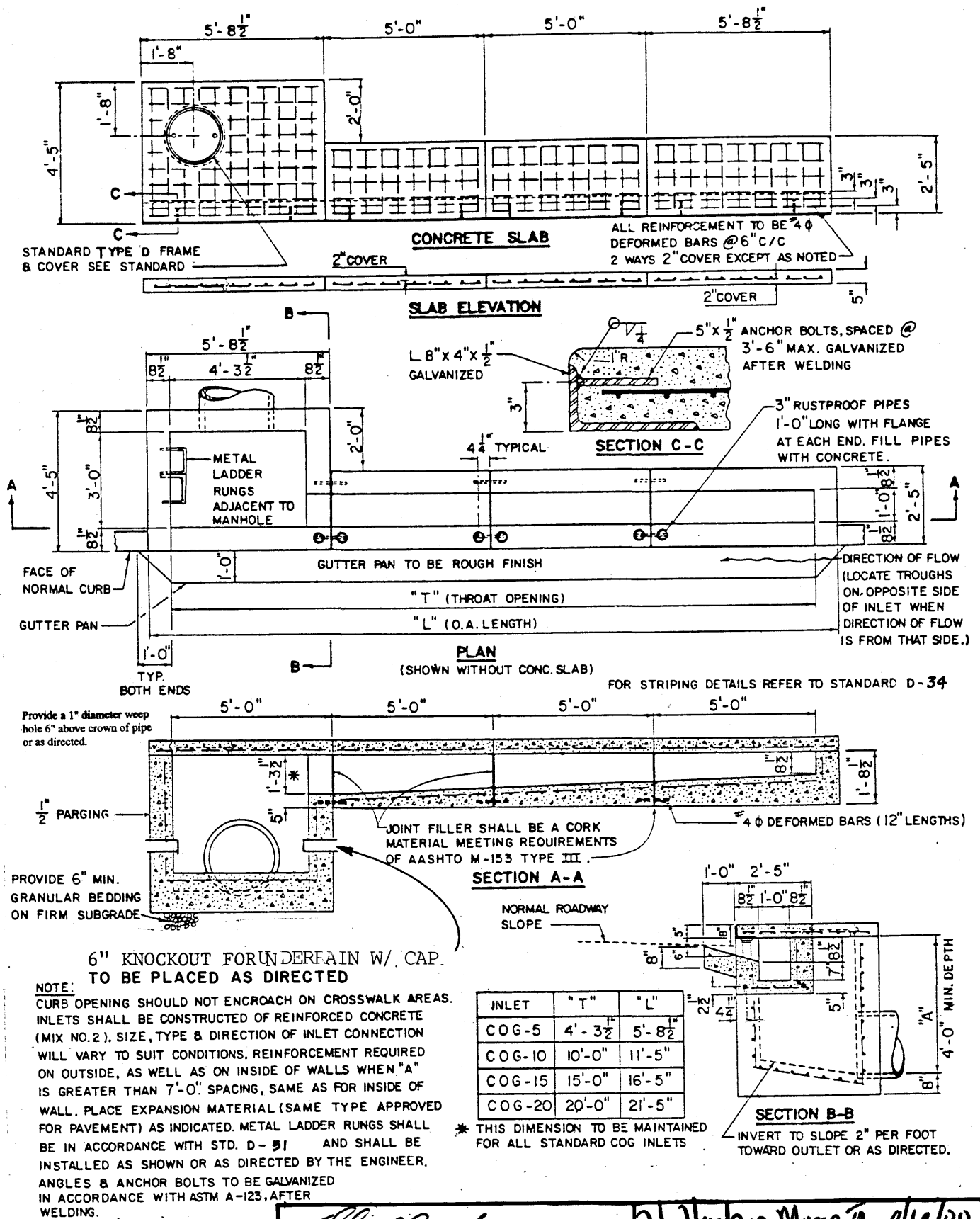
DIRECTOR OF PUBLIC WORKS	DATE
W. Hubert Wayne, III	4/12/00
DEP. DIRECTOR, PUBLIC WORKS	DATE

ISSUED	REVIS	REVIS	REVIS	PLATE
				D-32

# CURVED VANE (S-CV) GRATE FOR TYPE S INLET FRAMES

HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS





*Director Signature*  
DIRECTOR OF PUBLIC WORKS DATE

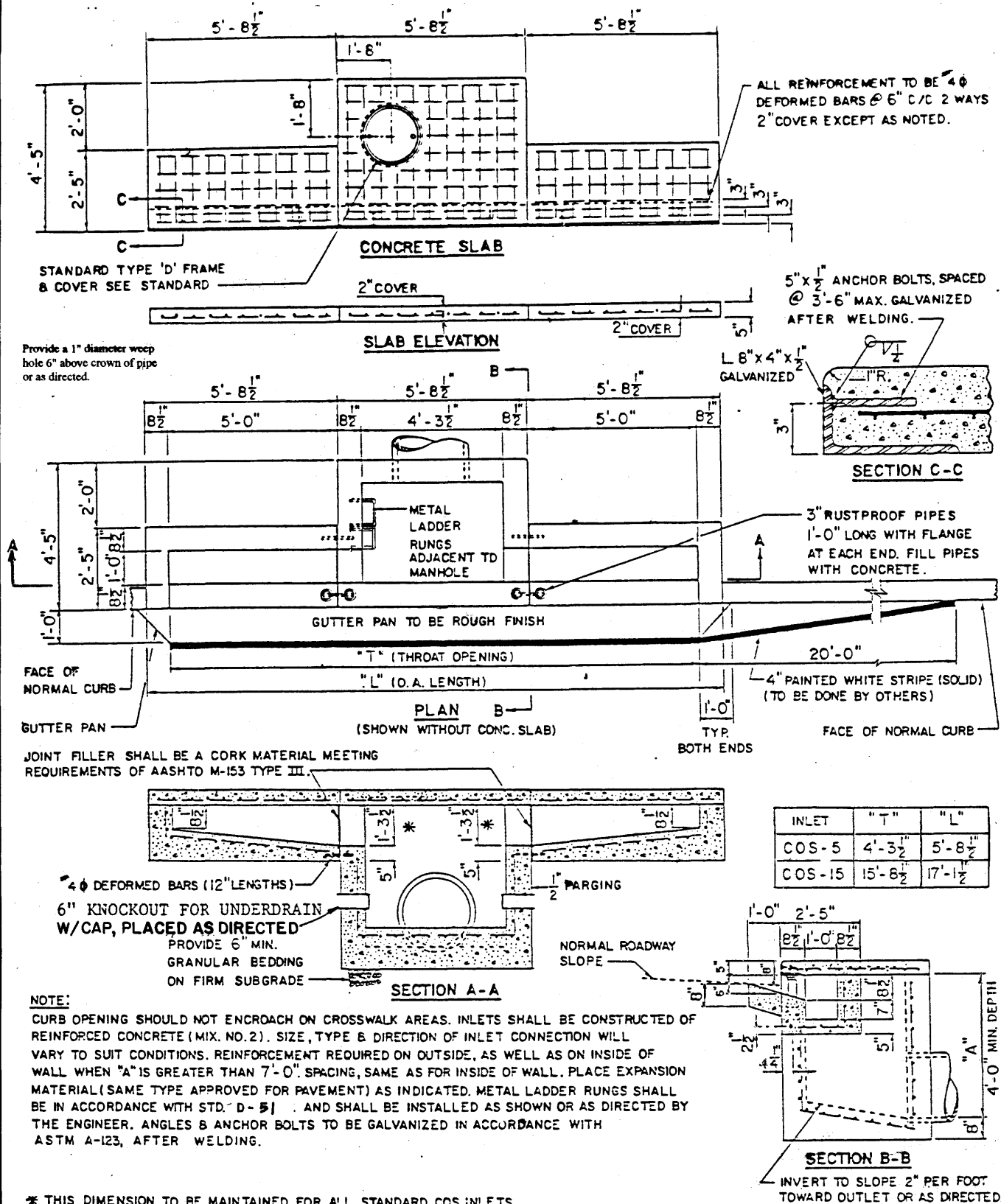
*Dep. Director Signature*  
DEP. DIRECTOR, PUBLIC WORKS DATE



**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**STANDARD COG INLETS**  
**5', 10', 15' & 20'**

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
**PLATE D-33**



*W. J. Caland* 5-200  
DIRECTOR OF PUBLIC WORKS DATE

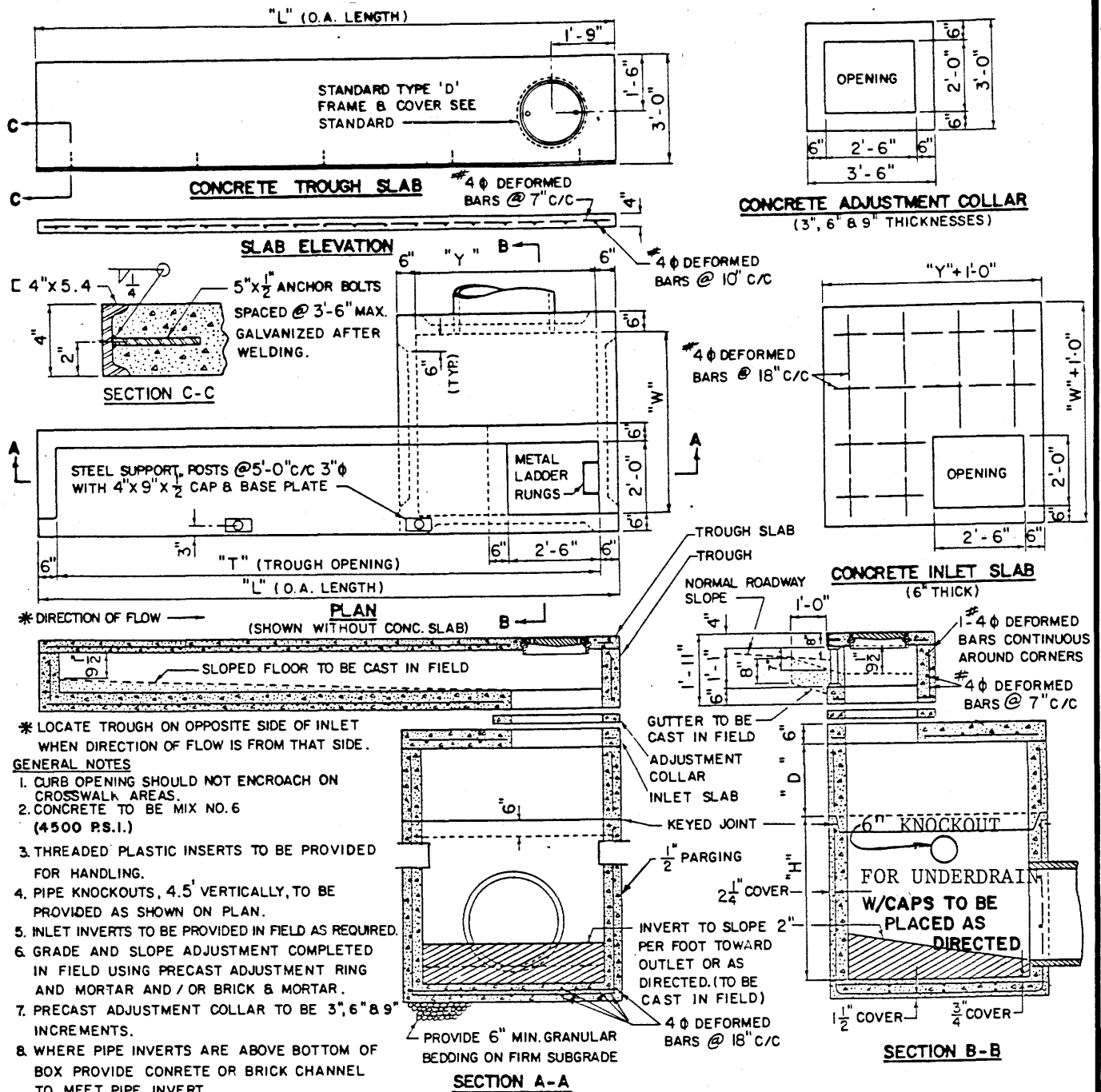
*W. Jackson Mung* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**STANDARD COS INLETS**  
**5' & 15'**

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
**PLATE D-34**



*W. L. Allen, Jr.* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE

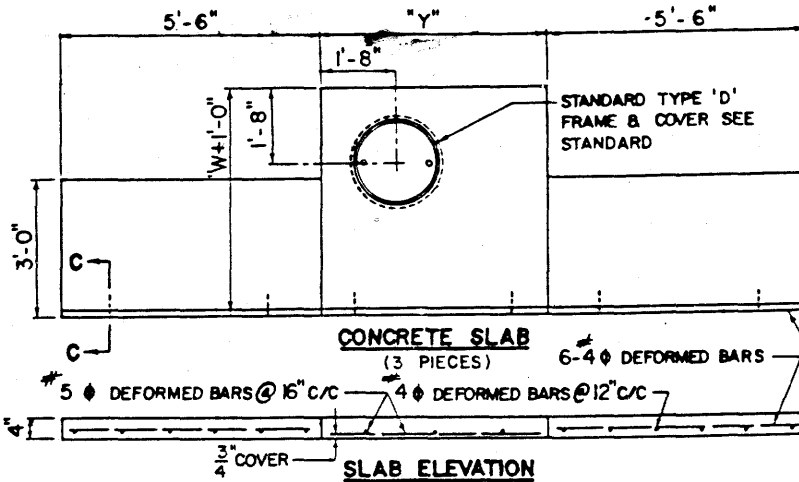
*D. J. Hickey* 4/2/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



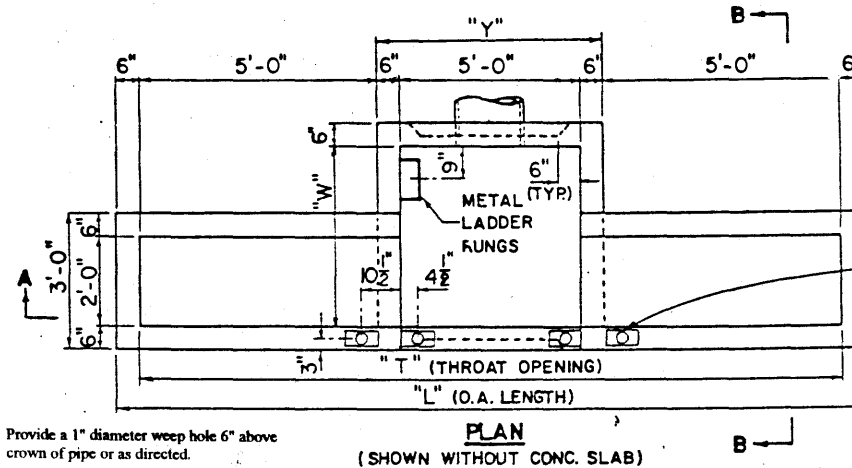
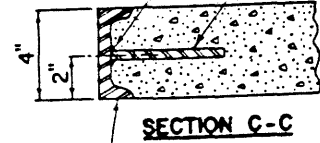
**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**PRECAST COG INLETS**  
**5', 10', 15' & 20'**

**ISSUED** \_\_\_\_\_  
**REVISED** \_\_\_\_\_  
**REVISED** \_\_\_\_\_  
**PLATE D-35**



5" x 1/2" ANCHOR BOLTS SPACED @ 3'-6" MAX. GALVANIZED AFTER WELDING

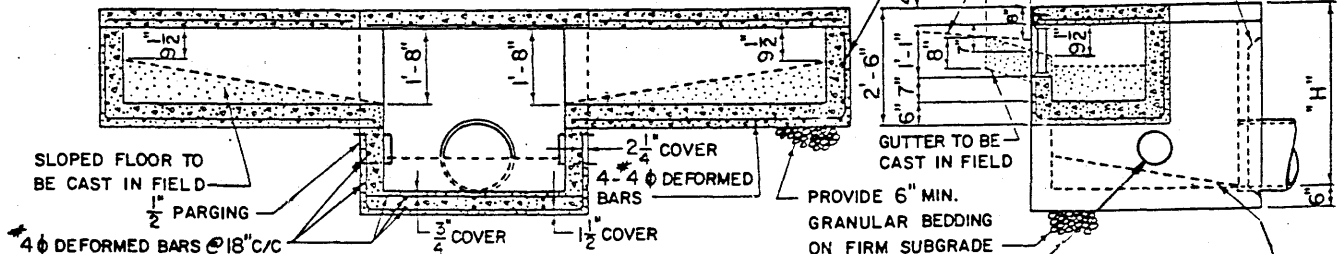


Provide a 1" diameter weep hole 6" above crown of pipe or as directed.

INLET	"T"	"L"
COS-5	5'-0"	6'-0"
COS-15	16'-0"	17'-0"

FOR CONFIGURATION OF GUTTER PAN & STRIPING DETAILS REFER TO STANDARD D-34

STEEL SUPPORT POSTS 3" Ø WITH 4" x 9" x 1/2" CAP & BASE PLATE



#### GENERAL NOTES

1. CURB OPENING SHOULD NOT ENCRANCH ON CROSSWALK AREAS.
2. CONCRETE TO BE MIX NO. 6
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. PIPE KNOCKOUTS 4.5' VERTICALLY, TO BE PROVIDED AS SHOWN ON PLAN.
5. INLET INVERTS TO BE PROVIDED IN FIELD AS REQUIRED.
6. WHERE PIPE INVERTS ARE ABOVE BOTTOM OF BOX PROVIDE CONCRETE OR BRICK CHANNEL TO MEET PIPE INVERT.
7. LADDER RUNGS SHALL BE IN ACCORDANCE WITH STANDARD D-51 AND SHALL BE INSTALL AS SHOWN OR AS DIRECTED BY THE ENGINEER.
8. CHANNELS AND ANCHOR BOLTS TO BE GALVANIZED IN ACCORDANCE WITH ASTM A-123, AFTER WELDING.
9. PIPE KNOCKOUTS, HORIZONTALLY, ARE CONTINGENT UPON THE SIZE OF THE PIPE CONNECTED. A 6" THICKNESS, HOWEVER, MUST BE MAINTAINED AROUND THE PERIMETER OF THE WALL.

3-4 CON INUOUS AROUND CORNERS NORMAL ROADWAY SLOPE 1'-0"

KNOCK OUT TO SUIT PIPE

GUTTER TO BE CAST IN FIELD

PROVIDE 6" MIN. GRANULAR BEDDING ON FIRM SUBGRADE

6" KNOCKOUTS FOR UNDERDRAIN W/ CAPS, PLACED AS DIRECTED

#### SECTION B-B

INVERT TO SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED. (TO BE CAST IN FIELD)

"W"	"Y"	"H"
6'-0"	6'-0"	4' TO 8'
8'-0"	6'-0"	4' TO 8'
10'-0"	6'-0"	4' TO 8'
12'-0"	6'-0"	4' TO 8'

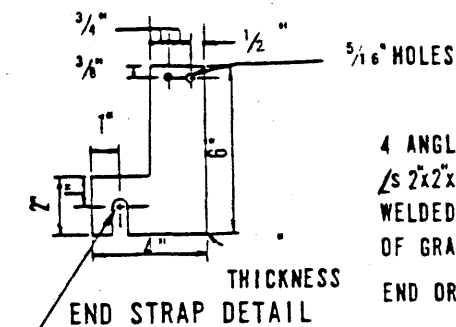
*John A. Adams* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. Jackson Myers* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
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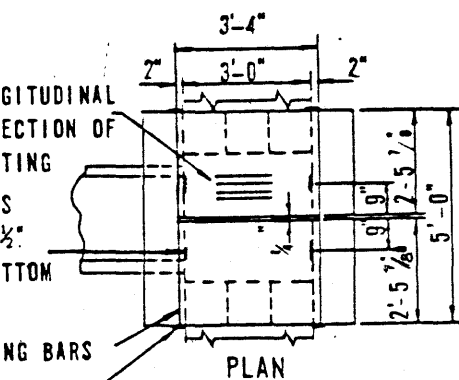
PRECAST COS INLETS  
5' & 15'

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-36



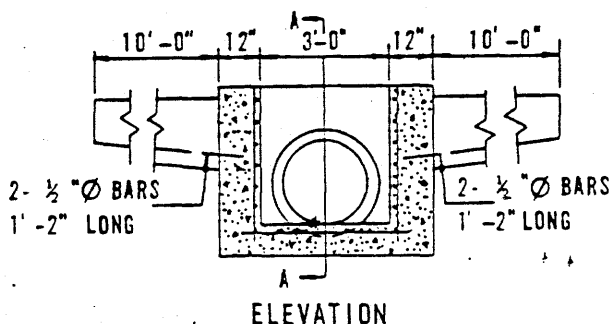
THICKNESS  
 END STRAP DETAIL  
 SLOTTED HOLE TO RECEIVE  
 $\frac{1}{2}$ " x 4" MACHINE BOLT (GALV.) IM-  
 BEDDED 3" IN CONC. WALL NUT TO BE  
 PLACED ON END OF BOLT AFTER GRATE  
 IS INSTALLED.

LONGITUDINAL  
 DIRECTION OF  
 GRATING  
 4 ANGLE CLIPS  
 $\angle$ s 2"x2"x3/16"x2 1/2"  
 WELDED TO BOTTOM  
 OF GRATING  
 END OR BINDING BARS

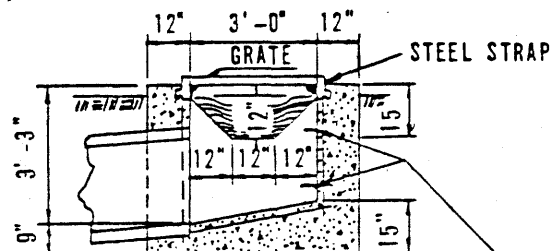


4 ANGULAR STEEL STRAPS BOLTED TO OUTSIDE  
 BARS OF GRATING PRIOR TO SHIPPING.

Provide a 1" diameter weep hole 6" above  
 crown of pipe or as directed.



ELEVATION



SECTION A-A

MANHOLE STEPS  
 1'-3" O/C

NOTE: THE CONCRETE VALLEY GUTTER TO BE USED IN  
 CONNECTION WITH THIS INLET WILL BE WARPED FROM THE  
 STANDARD SECTION TO MEET THE SECTION AT THE END OF  
 THE INLET. THIS TRANSITION WILL TAKE PLACE WITHIN  
 A DISTANCE OF TEN FEET FROM THE INLET. \*PAVING  
 WITHIN TEN FEET OF THE INLET TO BE INCLUDED IN THE  
 UNIT PRICE BID FOR THE INLET.

PIPE OUTLETS AND GUTTER APPROACHES CAN BE REVISED  
 TO MEET EXISTING CONDITIONS.

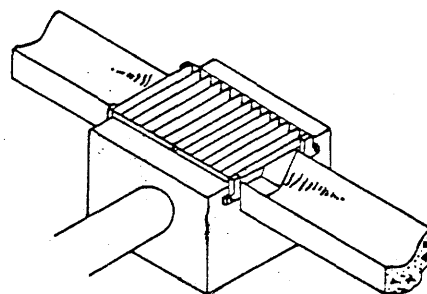
INLET - REINFORCEMENT -  $\frac{1}{2}$ "  $\phi$  BARS AT 6" C. TO C. 2"  
 COVER.

GRATINGS ARE SUBJECT TO APPROVAL FOR EACH JOB. ANY TYPE OF  
 SUBSTANTIAL TRANSVERSE BARS MAY BE USED WHICH WILL SUPPORT  
 A MINIMUM UNIFORM LOAD OF 150 LBS./SQ. FT. THE TRANSVERSE BARS  
 SHALL BE HELD RIGID BY SPACER BARS.

AREA TO BE MADE UP OF TWO EQUAL WIDTH PANELS ARRANGED FOR  
 BOLTING TOGETHER IN THE FIELD.

ALL MATERIAL TO BE HOT DIPPED GALVANIZED.

NOTE: THIS TYPE OF INLET MAY BE USED IN CONJUNCTION  
 WITH BERM DITCHES, BENCHES, AND SUMP AREAS OF INNER  
 LOOPS OF INTERCHANGES. IT IS NOT TO BE USED IN MEDIANS  
 OR OTHER AREAS TRAVERSED BY OUT-OF-CONTROL VEHICLES.



ISOMETRIC VIEW



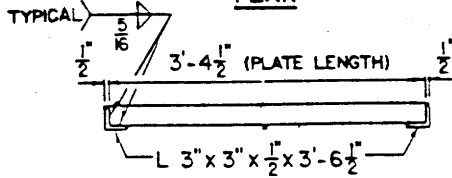
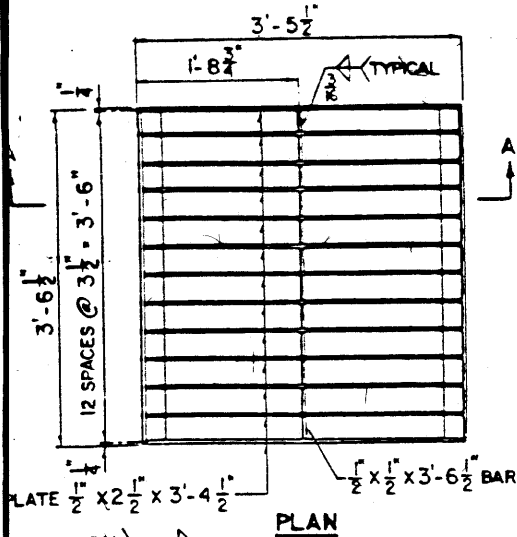
HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

SPECIAL TYPE K INLET  
 NON-TRAFFIC AREAS

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-37

# GENERAL NOTES

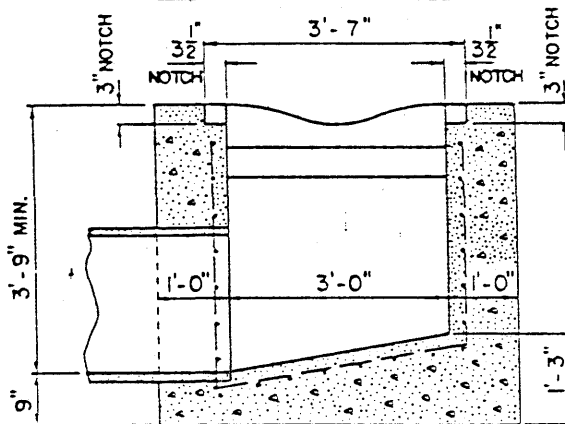
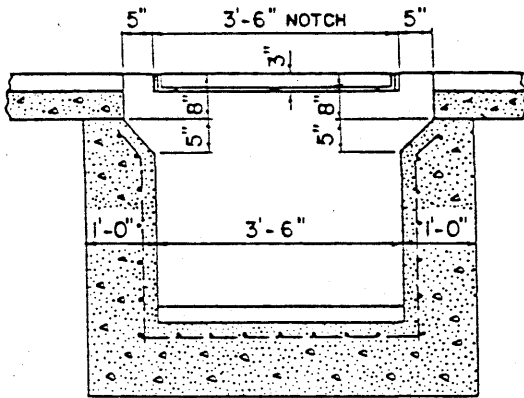
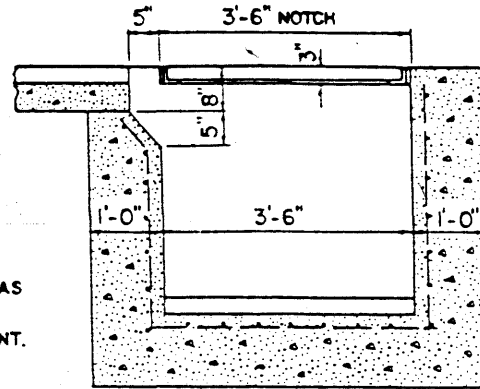
- 1 CONCRETE TO BE MIX NO. 2
- 2 REINFORCEMENT TO BE NO. 4 DEFORMED BARS AT 6 IN. C/C 2 IN. COVER
- 3 GRATE TO BE OF STEEL CONSTRUCTION 7 SHALL BE SQUARE, FLAT AND TRUE
- 4 STRUCTURAL STEEL SHALL BE A.S.T.M. DESIGNATION A-36
- 5 GRATE TO BE GALV. AFTER FABRICATION IN ACCORDANCE WITH A.S.T.M. A-123 EXCEPT FOR ADHERENCE WHICH SHALL BE IN ACCORDANCE WITH A.S.T.M. DESIGNATION A-153



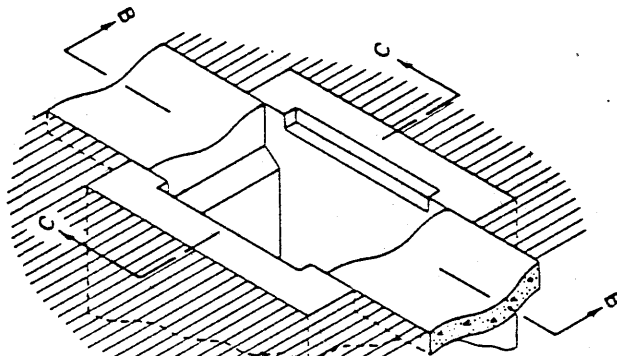
Provide a 1" diameter weep hole 6" above crown of pipe or as directed.

NOTE: GRATE TO BE AS SHOWN OR FURNISH APPROVED EQUIVALENT.

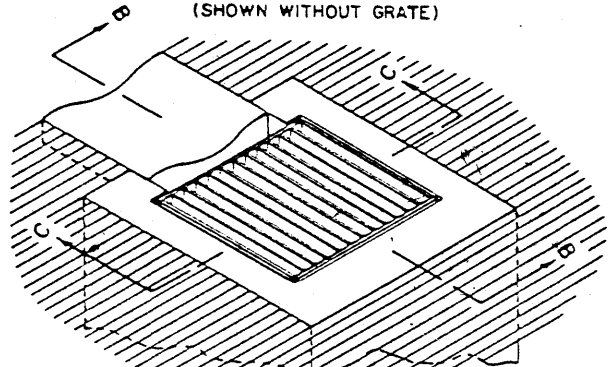
CONCRETE GUTTER TO BE PAID FOR SEPARATELY.



TYPICAL BOTH INLETS (SHOWN WITHOUT GRATE)



DOUBLE OPENING (SHOWN WITHOUT GRATE)



SINGLE OPENING

NOTE: FOR USE IN NON-TRAFFIC LOCATIONS ONLY

*[Signature]* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

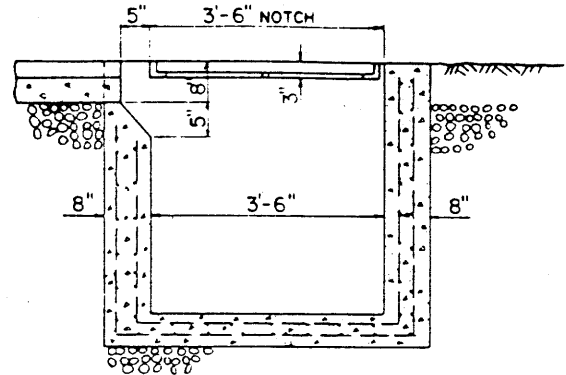
STANDARD TYPE K INLET  
OPEN-END GRATE

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-38



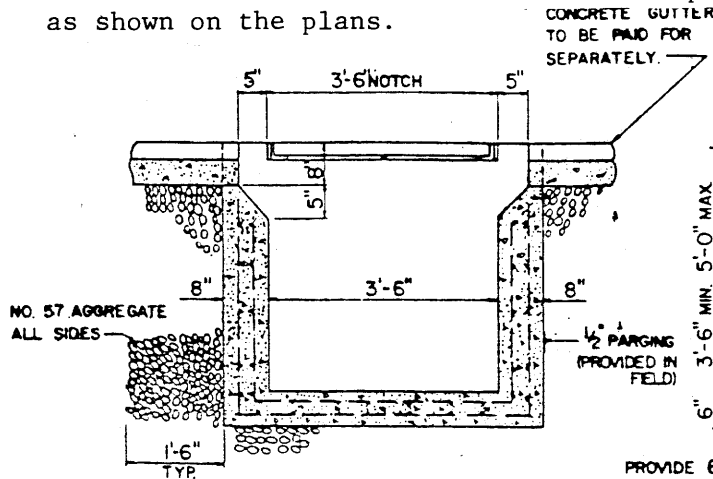
# GENERAL NOTES

1. Concrete to be mix no. 6 (4500 P.S.I.)
2. Reinforcing-2 layers of 4x4-W40xW40 welded wire fabric.
3. Threaded plastic inserts to be provided for handling.
4. Pipe openings to be provided as required. For size, location and invert elevations refer to construction plans.
5. For grate details see Harford County to be as shown or furnish approved equivalent.
6. "Minimum Depth" payment per "each" inlet includes depths up to 3'-6". Vertical depth payment per "Linear Foot" includes depths in excess of 3'-6".
7. A 6" perforated circular pipe, for erosion and sediment control, shall be placed in the inlet wall at all inlet sediment traps as shown on the plans.

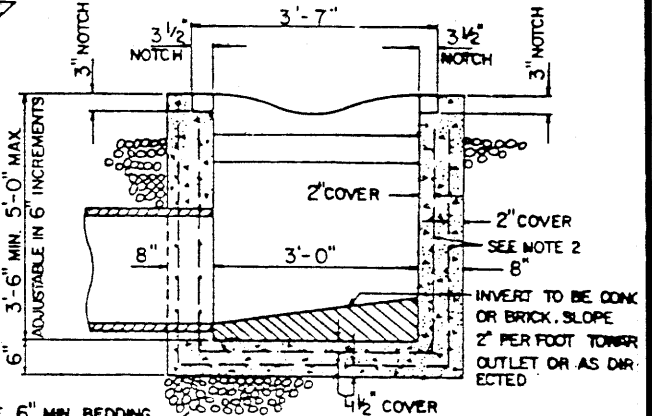


SECTION B-B SINGLE OPENING

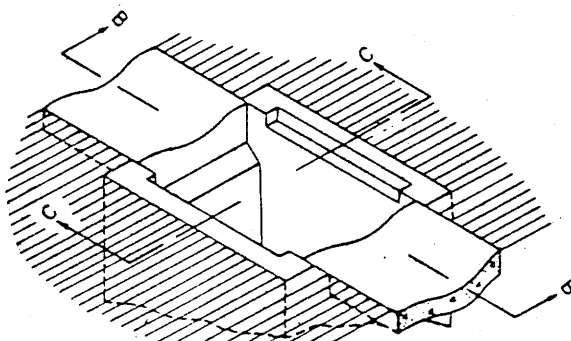
Provide a 1" diameter weep hole 6" above crown of pipe or as directed.



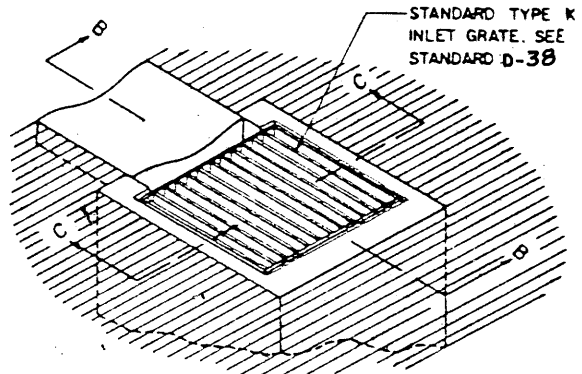
SECTION B-B DOUBLE OPENING



SECTION C-C  
 TYPICAL BOTH INLETS  
 (SHOWN WITHOUT GRATE)



DOUBLE OPENING  
 (SHOWN WITHOUT GRATE)



SINGLE OPENING

NOTE: FOR USE IN NON-TRAFFIC LOCATIONS ONLY.

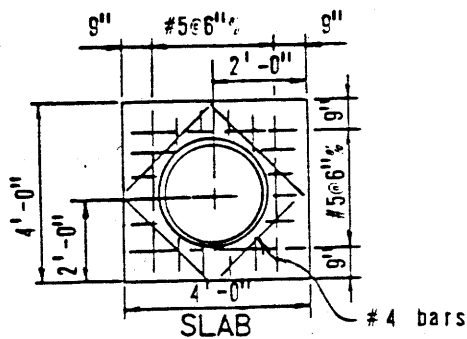


HARFORD COUNTY, MD  
 DEPARTMENT OF  
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PRECAST TYPE K INLET  
 OPEN-END GRATE

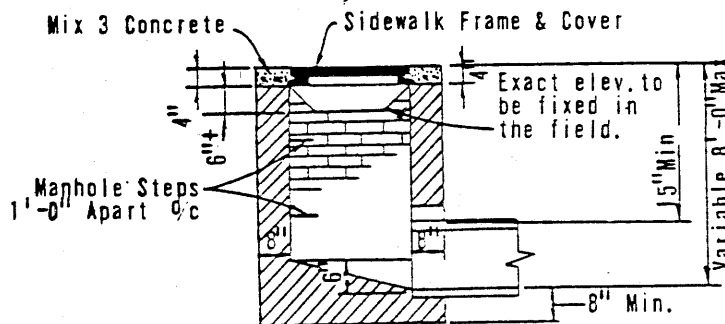
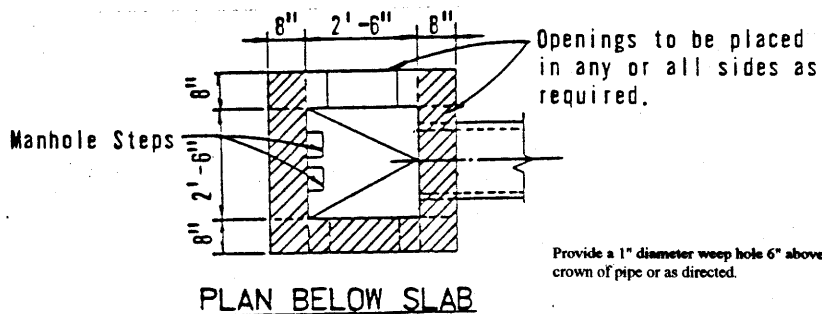
ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-39

*W. H. Allen Jr.* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*H. W. W. Myers, Jr.* 4/2/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

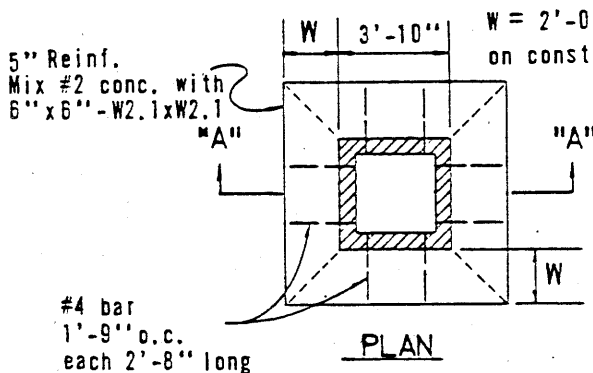


NOTES:

1. Invert shall be brick or plain Mix 3 Concrete.
2. Top 4" of walls shall be brick masonry.

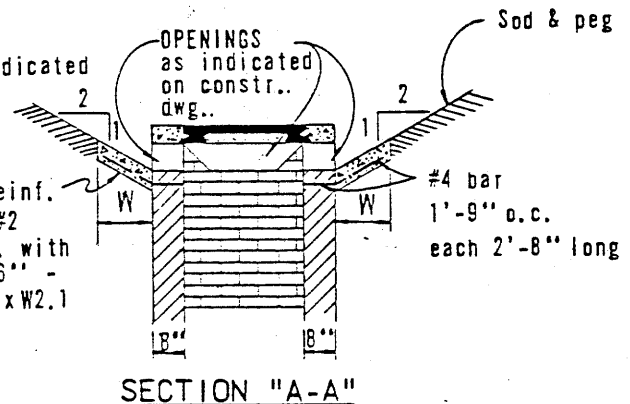


SECTION



W = 2'-0" or as indicated on constr. dwg.

5" Reinf. Mix #2 Conc. with 6" x 6" - W2.1 x W2.1



OPTIONAL CONCRETE COLLAR

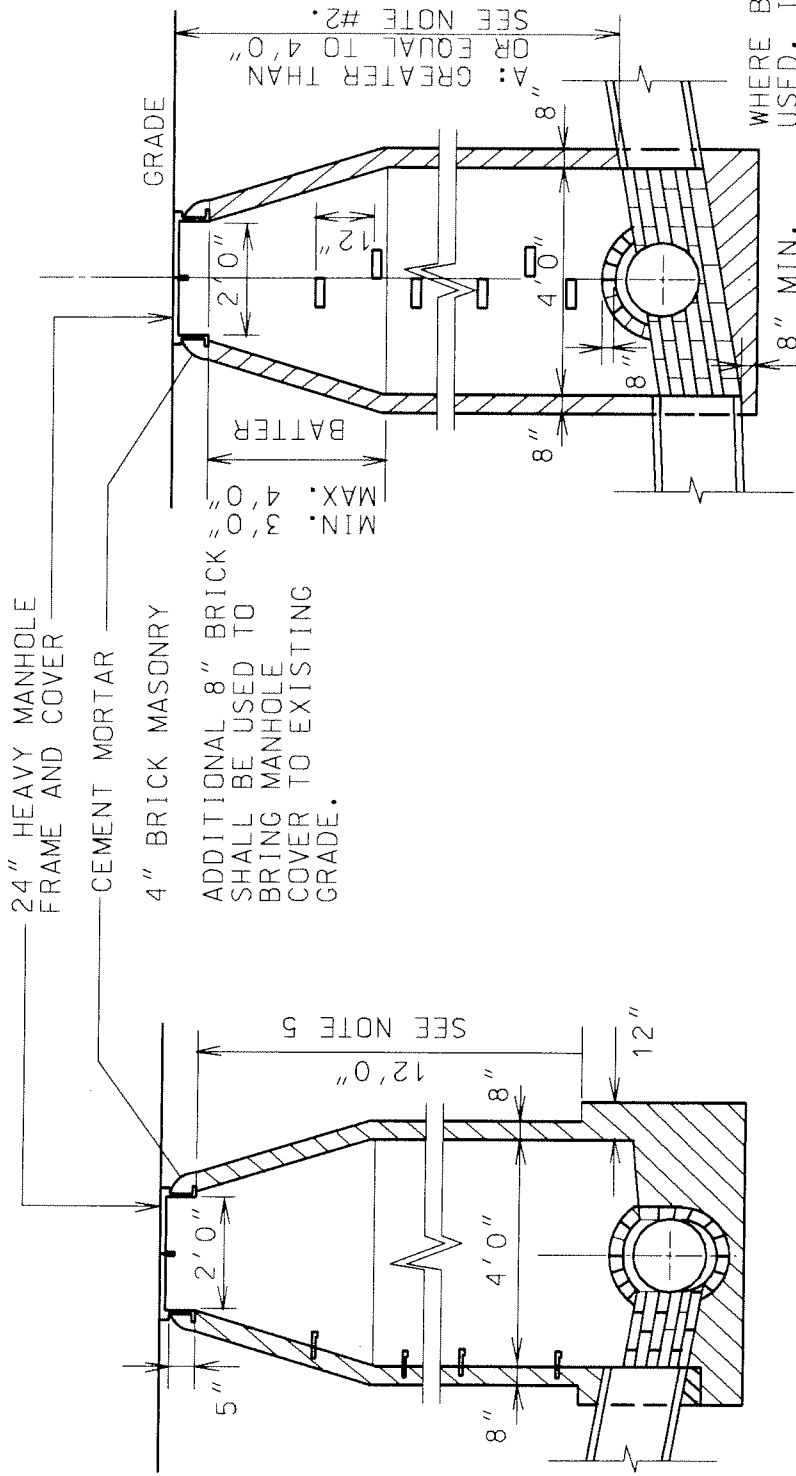


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TYPE Y-1 INLET

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-40





NOTES:

1. MANHOLE MUST BE BRICK OR PLAIN MIX 3 CONCRETE, POURED IN PLACE.
2. WHERE A (COVER) IS LESS THAN 4' 0", USE TYPE B MANHOLE WHEN PIPES ARE 36" DIAMETER AND SMALLER.
3. FOR PIPE DIAMETERS 42" OR LARGER, USE A TYPE C MANHOLE.
4. FOR PIPE 30" H.D. AND LARGER, WITH CURVE CENTERLINE LENGTH GREATER THAN 4'.
5. THICKNESS OF WALLS TO BE INCREASED TO 12", 12' 0" BELOW UNDERSIDE OF FRAME.
6. FOR PRECAST ALTERNATE, SEE PLATE D-43.
7. PROVIDE STANDARD MANHOLE STEPS. SEE STANDARD D-51.
8. PROVIDE A 1" DIAMETER WEEP HOLE, 6" ABOVE THE CROWN OF PIPE OR AS DIRECTED.



**HARFORD COUNTY, MD**  
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**PUBLIC WORKS**

**TYPE A MANHOLE**  
 (FOR COVER 4' OR MORE)  
 (FOR PIPE 15" TO 36" HORIZONTAL DIA.)

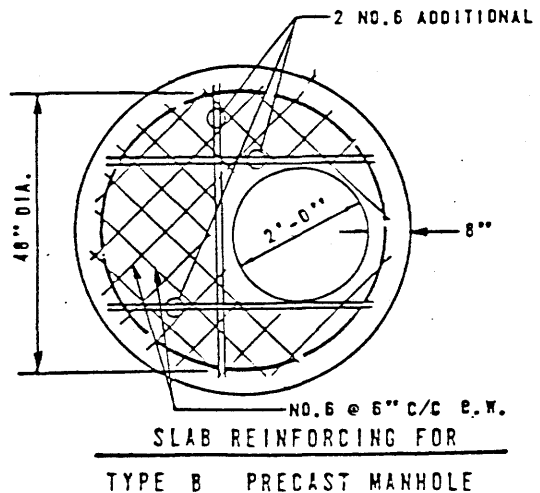
<i>W. A. Adams</i>	5:20:00
DIRECTOR OF PUBLIC WORKS	DATE
<i>W. W. Adams, Jr.</i>	4/12/00
DEP. DIRECTOR, PUBLIC WORKS	DATE

ISSUED	
REVISED	
REVISED	
PLATE	D-42

NOTES:

- EXCEPT AS NOTED, MANHOLE TAPERS, RISERS AND BASES SHALL BE FURNISHED IN STRICT ACCORDANCE WITH ASTM DESIGNATION C-478 (LATEST) FOR 'PRECAST REINFORCED CONCRETE MANHOLE SECTIONS'.
- MANHOLE BASES SHALL BE OF MIX NO.5 CONCRETE OR POURED IN-PLACE MIX NO.3 CONCRETE, OR 8" MIN. BRICK.

Provide a 1" diameter weep hole 6" above crown of pipe or as directed.



STANDARD STORM DRAIN  
HEAVY TRAFFIC MANHOLE  
FRAME AND COVER

CEMENT MORTAR

BRICK MASONRY  
MAX. -12"  
MIN. -2 COURSES

MANHOLE STEPS

2'-0"

3'-0" MIN.  
TAPER LENGTHS

12"

6"

MINIMUM CIRCUMFERENTIAL REINFORCING  
(48" DIA. TAPER)  $A_s = 0.12$  SQ. IN./FT.

PIPE SIZE	MIN. MH BASE LENGTH	MIN. H FOR A MAX. H FOR B
15" DIA.	3'	6.5'
18" TO 24" DIA.	4'	7.5'
27" TO 36" DIA.	5'	8.5'

H  
(NOT TO EXCEED 30 FEET)

RUBBER GASKET  
ASTM C-443

RISERS IN 1', 2', 3' OR 4' LENGTHS - MIX NO.5

PROVIDE STEPS IF ADD. SECTIONS ARE USED

MIN. CIRCUMFERENTIAL  
REINF. PER ASTM C-478  
UNLESS OTHERWISE NOTED.

BRICK MASONRY  
MAX. -12"  
MIN. -2 COURSES

MIN. CIRC. REINF.  
PER A.S.T.M.  
C76-66T TABLE III,  
WALL B FOR PIPE  
DIAMETERS  
GREATER  
THAN 18"

BRICK ON  
EDGE

12" MIN.

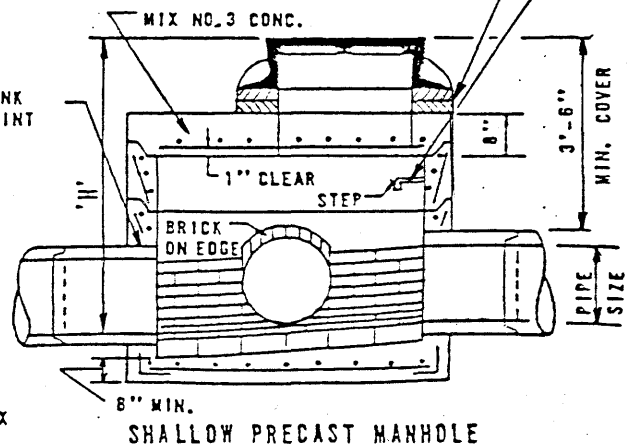
NON-SHRINK  
GROUT JOINT  
FILLER

PIPE  
SIZES

8" MIN.

MIN. SLAB REINFORCING  
 $A_s = 0.39$  SQ. IN./FT. E.W.

BRICK ON  
EDGE OR MIX  
NO.3 CONC.



Alternate 48" TYPE A

Alternate 48" TYPE B

*L. H. Allen, Jr.* 5-200  
DIRECTOR OF PUBLIC WORKS DATE

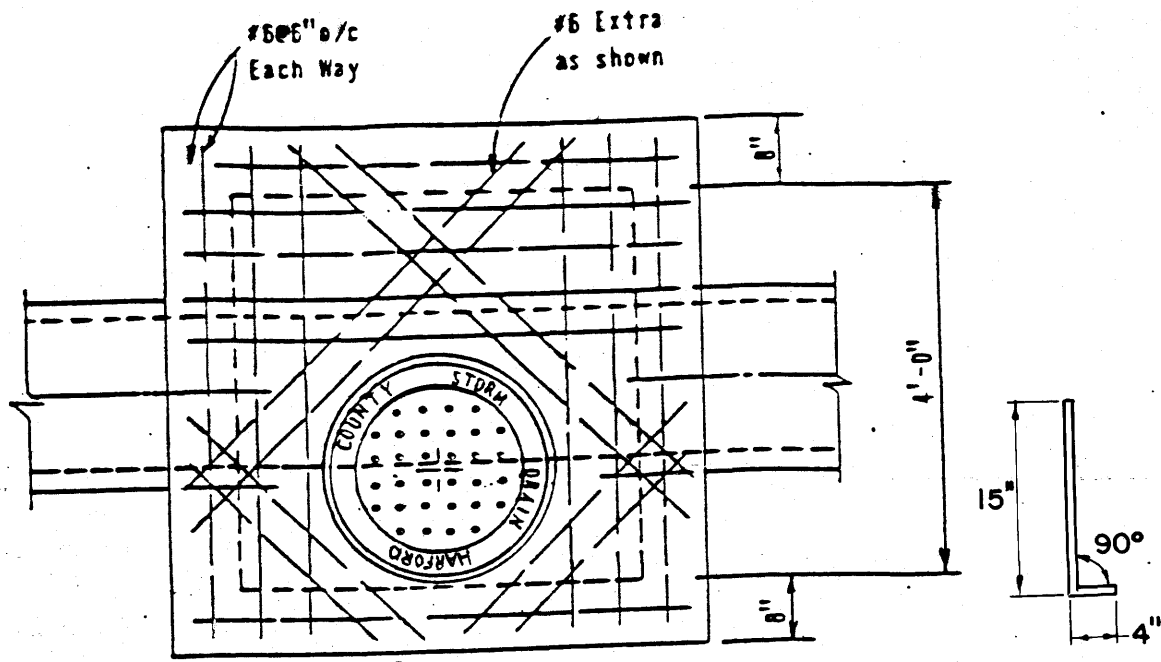
*V. Hudson Myers, Jr.* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS, DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

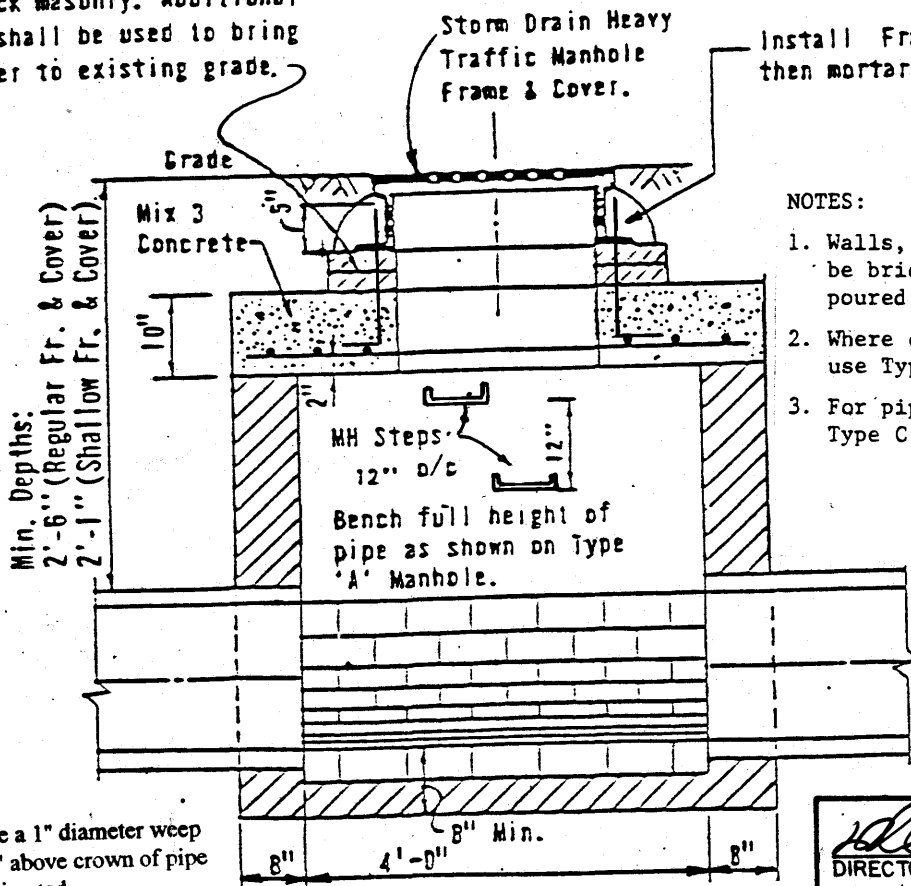
PRECAST A & B MANHOLE  
(FOR PIPES 15" TO 36" HORIZ. DIAM.)

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-43



PLAN

4" Brick masonry. Additional brick shall be used to bring MH Cover to existing grade.



SECTION

Install Frame w/4 Dowels 90° apart then mortar.

NOTES:

1. Walls, bottom slab and invert shall be brick or plain Mix 3 concrete poured in place.
2. Where cover is greater than 4'-0", use Type A manhole.
3. For pipe sizes 42" and larger, use Type C manhole.

Provide a 1" diameter weep hole 6" above crown of pipe or as directed.

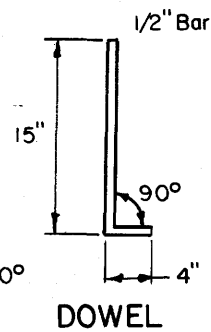
*W. L. Alton* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. L. Alton* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

TYPE B SHALLOW MANHOLE  
(FOR COVER LESS THAN 4')  
(FOR PIPES 15" TO 36" HORIZ. DIAM.)

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-44



4" Brick masonry. Additional brick shall be used to bring MH Cover to existing grade if required.

Storm Drain Heavy  
Traffic Manhole  
Frame & Cover.

Install frame & 4 dowels 90° apart, then mortar.



1. Walls, bottom slab, and invert must be brick or plain Mix #3 concrete poured in place.
2. For covers greater than 4'0", use Type A Manhole.
3. For pipe sizes 42" and larger, use Type C Manhole.

**Provide a 1" diameter weep hole 6" above crown of pipe or as directed.**

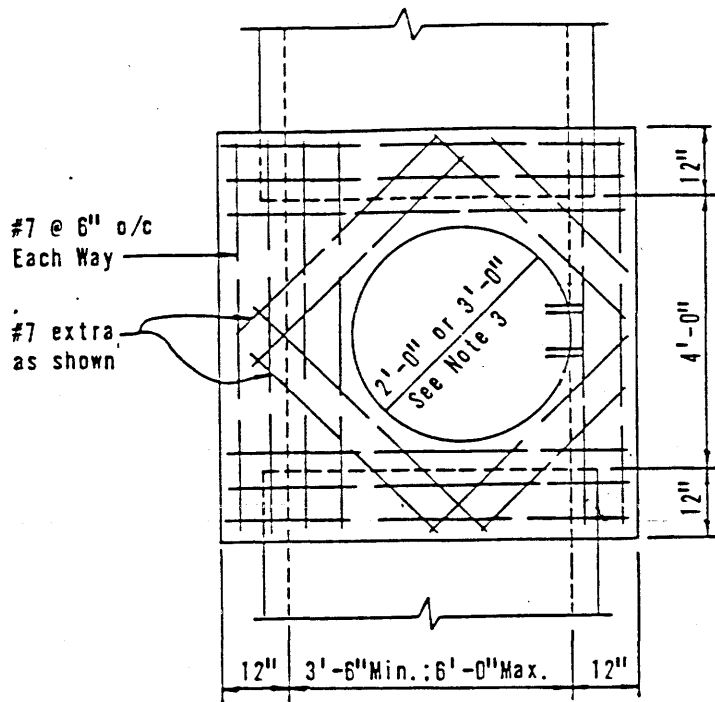
W. L. Allen, Jr. 5-2-60  
DIRECTOR OF PUBLIC WORKS DATE  
D. Henderson Myers, III 4/2/60  
DEP. DIRECTOR PUBLIC WORKS DATE



**HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS**

ALTERNATE TYPE B  
SHALLOW MANHOLE  
(For cover less than 4')  
(For Pipes 15" to 36" Horiz. Dia.)

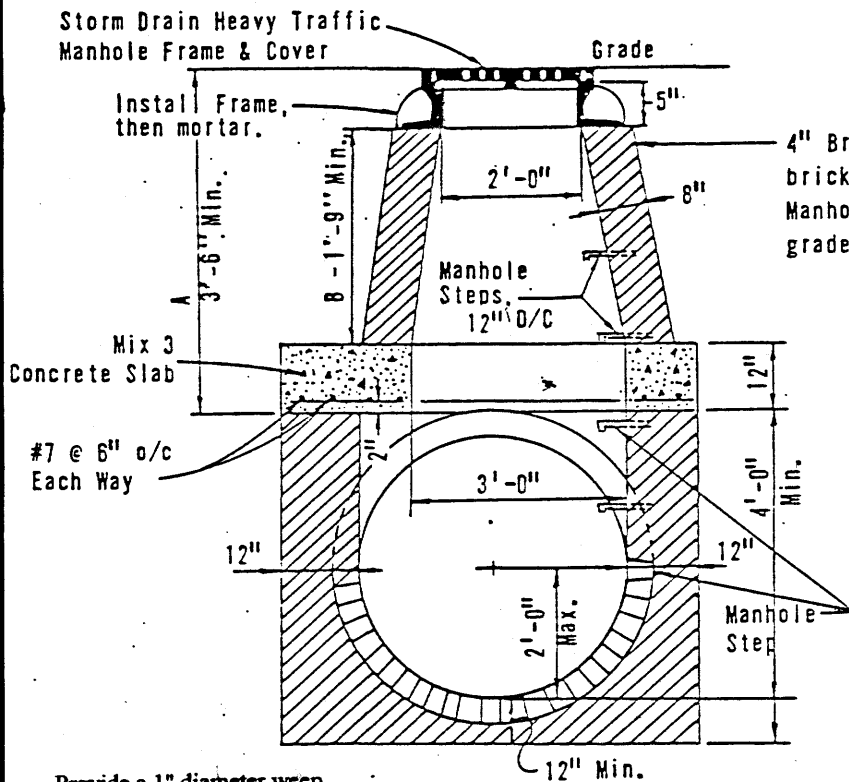
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-45



TOP SLAB

NOTES:

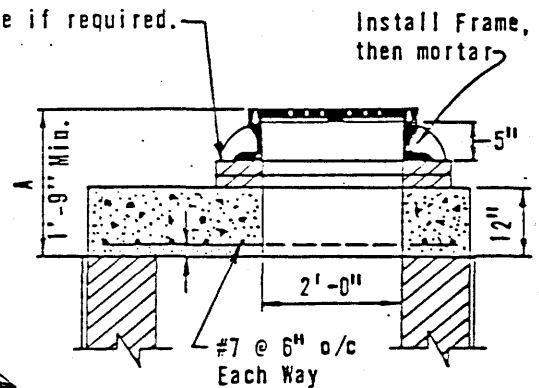
1. Walls, bottom slab and invert shall be brick or plain Mix 3 concrete poured in place.
2. For pipes 36" and smaller, use Type A or Type B Manhole. Use Type B where A (cover) is less than 3'-6".
3. Where A is less than 3'-6", use Alternate Manhole Stack.



Provide a 1" diameter weep  
hole 6" above crown of pipe  
or as directed.

SECTION

4" Brick Masonry. Additional  
brick shall be used to bring  
Manhole Cover to existing  
grade if required.



ALTERNATE MANHOLE STACK  
(See Note 3)

*[Signature]* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
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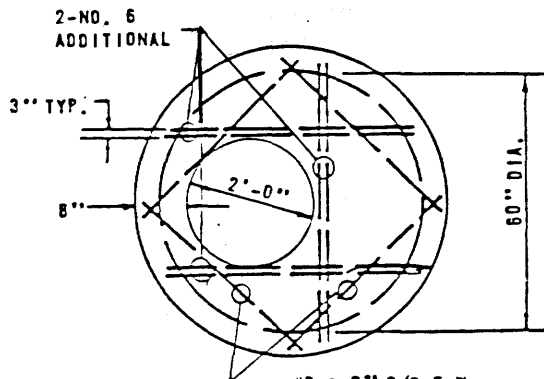
TYPE C MANHOLE - C1  
42" & LARGER PIPES  
(DEFLECTION & LENGTH ≤ 4')

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D - 46

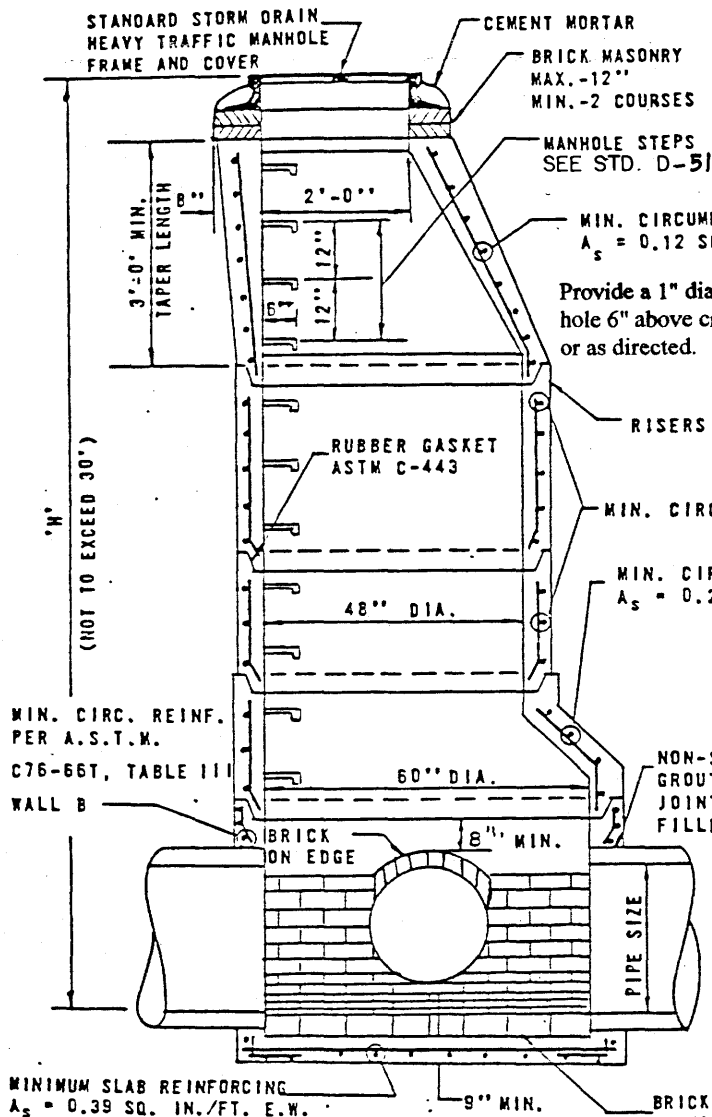


NOTES:

- EXCEPT AS NOTED, MANHOLE TAPERS, RISERS AND BASES SHALL BE FURNISHED IN STRICT ACCORDANCE WITH ASTM DESIGNATION C-478 (LATEST) FOR 'PRECAST REINFORCED CONCRETE MANHOLE SECTIONS'
- MANHOLE BASES SHALL BE OF MIX NO.5 CONCRETE OR POURED IN PLACE MIX NO.3 CONCRETE OR 8" MIN. BRICK.

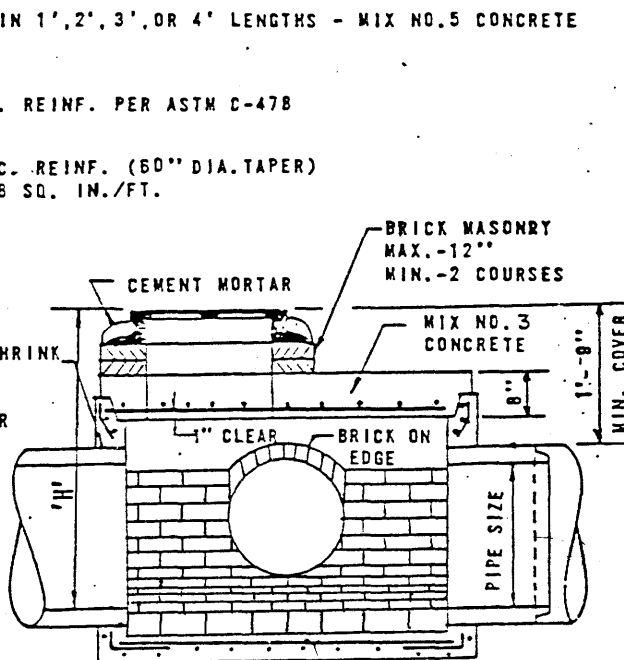


SLAB REINFORCING FOR  
SHALLOW STACK MANHOLE



C-2

PIPE SIZE	MIN. MH BASE LENGTH	MIN. H FOR A-2 MAX. H FOR A-3
42"	6'	12'
48"	7'	13'



C-3

*[Signature]* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE

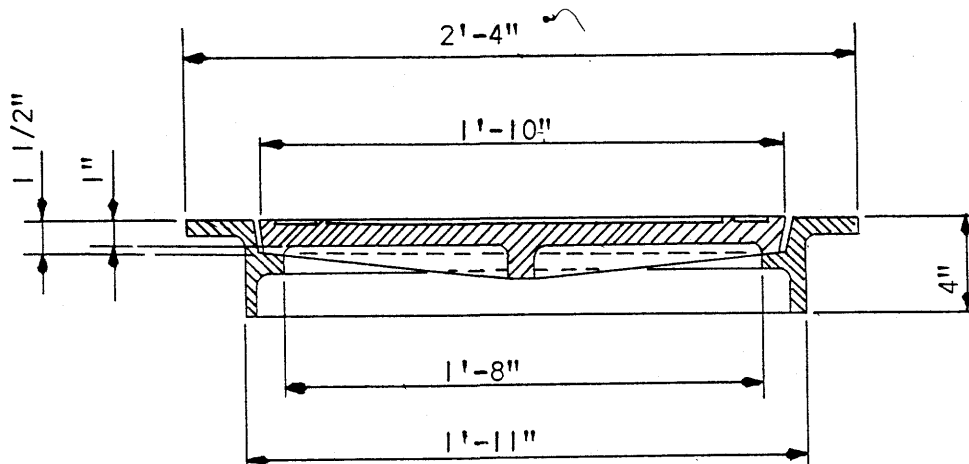
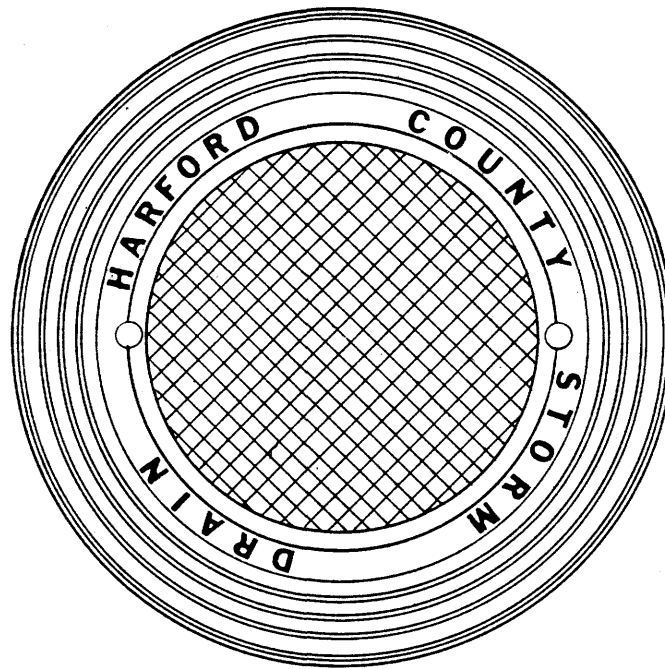
*[Signature]* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

PRECAST ALTERNATE  
TYPE C MANHOLES  
(FOR PIPE 42" AND 48" HORIZ. DIAM.)

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-47



NOTE: MATERIAL SHALL BE GREY IRON CASTINGS MUST BE MACHINED ON BEARING SURFACES.

FRAME AND GRATE  
WEIGHT 185 LBS.

*J. R. Allen, Jr.* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*U. Hudson* 4/2/00  
DEP. DIRECTOR, PUBLIC WORKS DATE

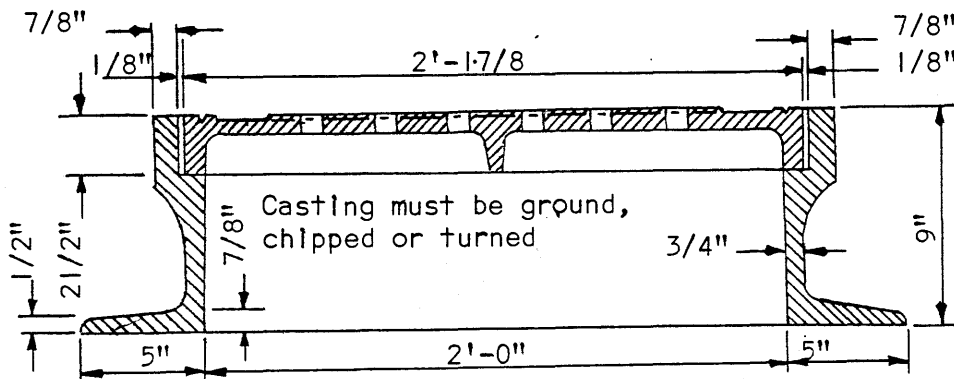
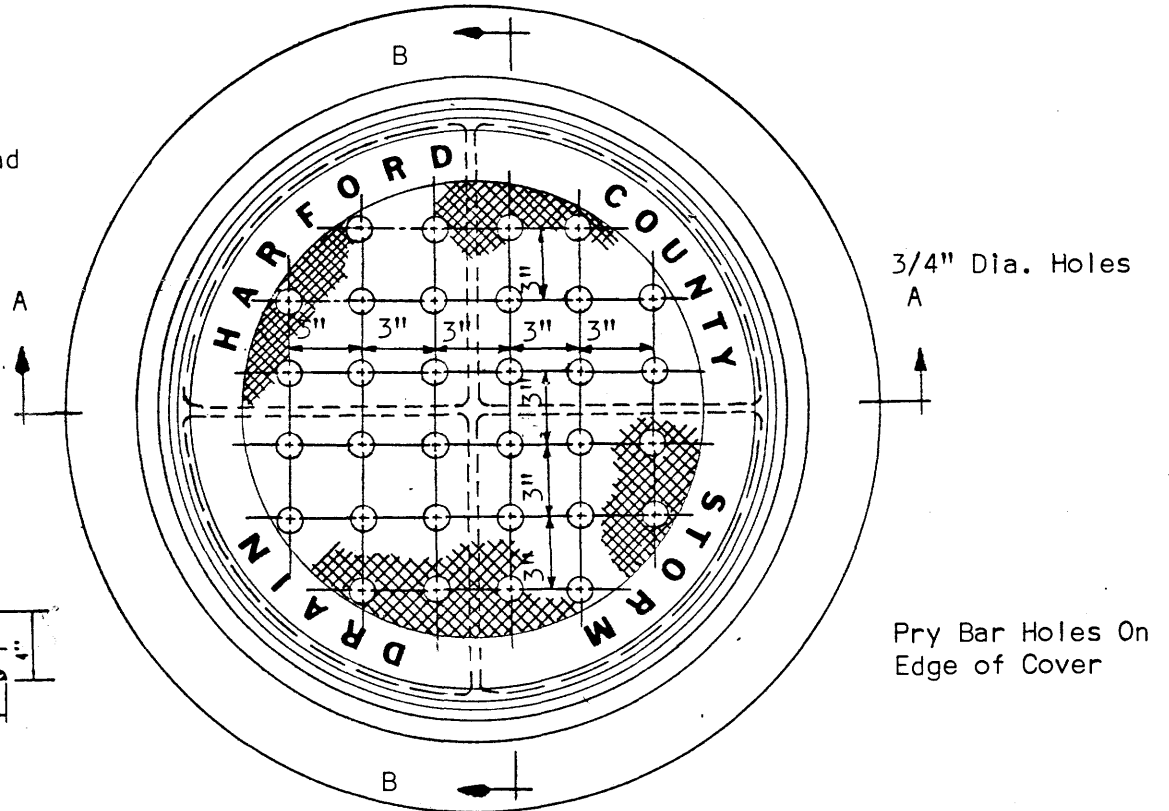
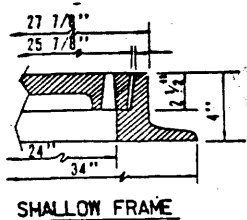


HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

SIDEWALK FRAME AND COVER  
(FOR REPLACEMENT PURPOSES ONLY)

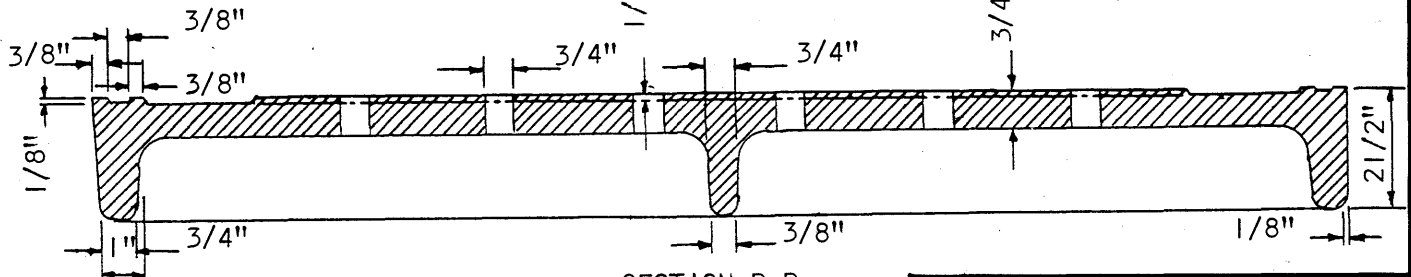
ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-48

Standard Diamond  
Grid



SECTION A-A

W.T., COVER 134 LBS.  
W.T., FRAME 250 LBS.



SECTION B-B

NOTE - Frame & Cover for 54" and larger bends and junction chambers shall be Dewey Bros. Inc. RCR-62C or equal with lettering & hole as shown for 2'-0" Frame.

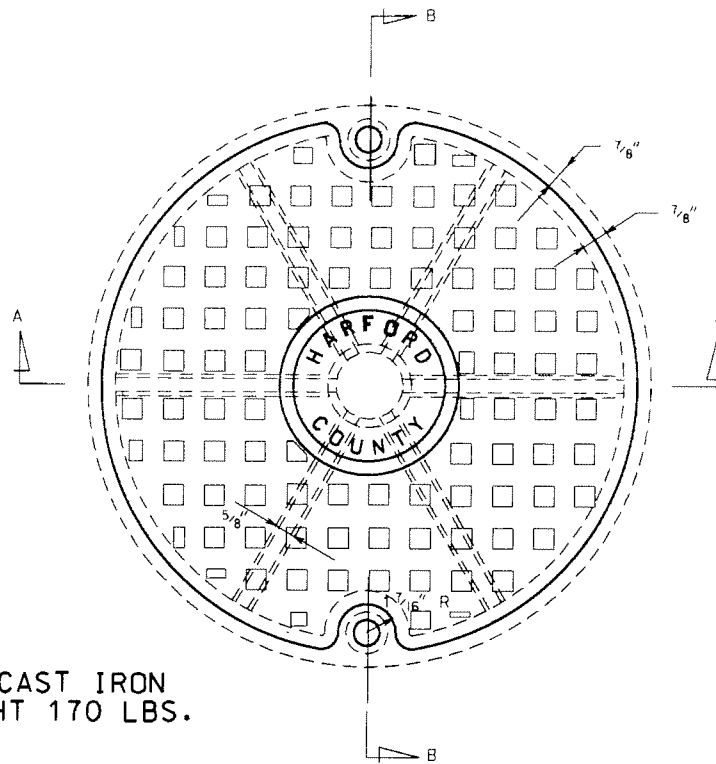
*L. H. Allen* 5200  
DIRECTOR OF PUBLIC WORKS DATE  
*D. J. Johnson* 4/2/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

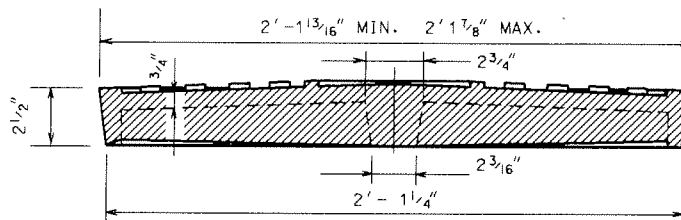
24"  
HEAVY TRAFFIC MANHOLE  
FRAME AND COVER

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-49

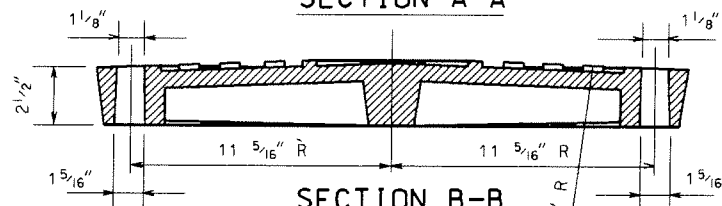


MATERIAL - CAST IRON  
APPROX. WEIGHT 170 LBS.

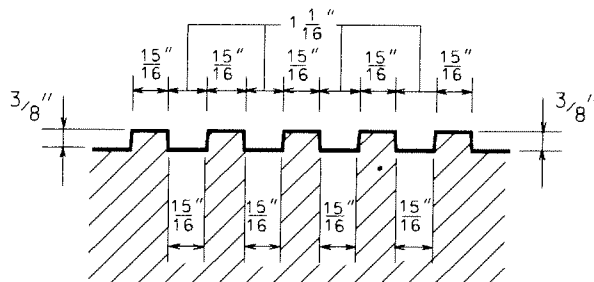
PLAN



SECTION A-A



SECTION B-B



DETAIL OF CORRUGATIONS

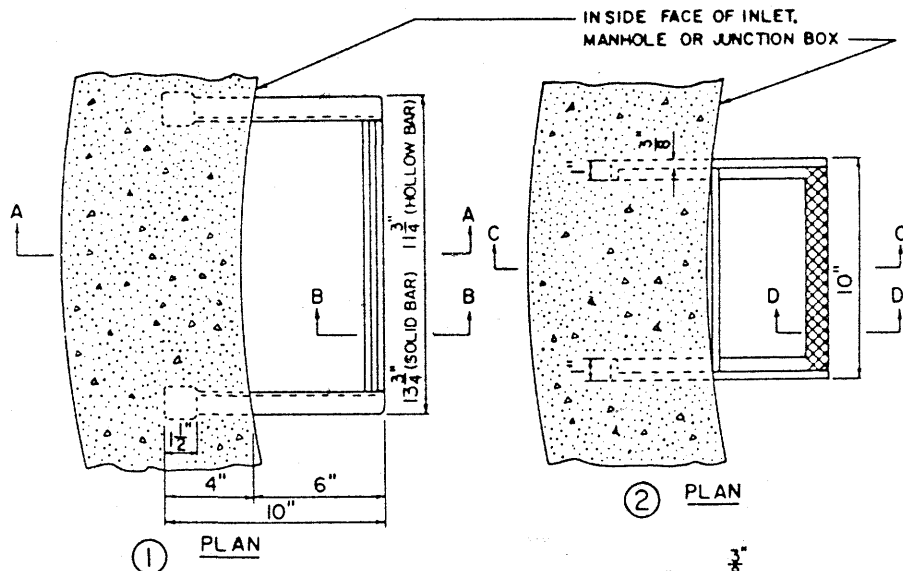
*William A. D.* 5-20  
DIRECTOR OF PUBLIC WORKS DATE  
*W. Hudson Myers, Jr.* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



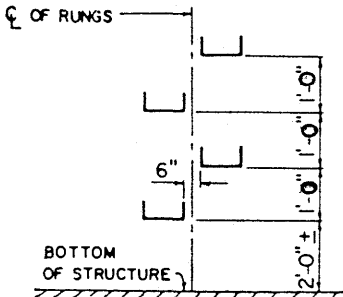
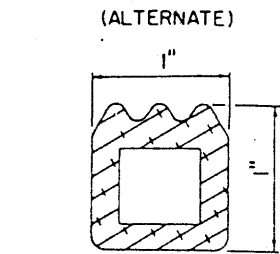
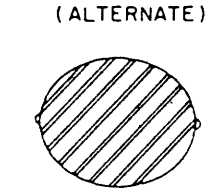
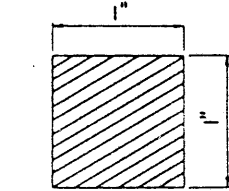
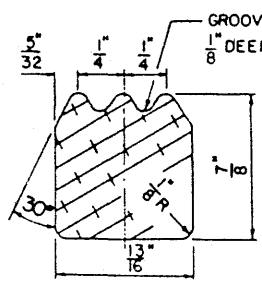
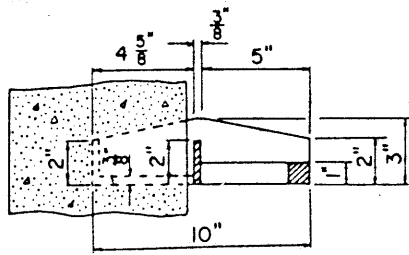
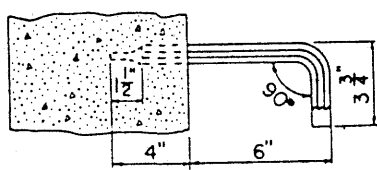
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

STANDARD MANHOLE  
TYPE A COVER

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-50



② PLAN



NOTE: METAL LADDER RUNGS ARE TO BE USED IN INLETS, MANHOLES, AND JUNCTION BOXES OVER THREE FEET IN DEPTH OR AS DIRECTED BY THE ENGINEER, USED EITHER WITH BRICK OR CONCRETE CONSTRUCTION. (WHERE BRICK CONSTRUCTION IS EMPLOYED, THE MORTAR JOINTS SHALL BE ADJUSTED TO ACCOMMODATE LADDER RUNGS.) METAL LADDER RUNGS MAY BE COMPRISED OF ONE OF THE FOLLOWING.

- ① ALUMINUM ALLOY - SHALL CONFORM TO A.S.T.M. DESIGNATION B 221 ALLOY 6061-T6. THAT PORTION EMBEDDED IN THE STRUCTURE SHALL BE COATED WITH ZINC CHROMATE OR APPROVED EQUIVALENT COATING.
- ② CAST IRON - SHALL CONFORM TO A.S.T.M. A-48 CLASS 30 B.
- ③ STEEL - SHALL CONFORM TO A.S.T.M. DESIGNATION A-615 GRADE 40, GALVANIZED AFTER FABRICATION AS PER A.S.T.M. DESIGNATION A-153.

*L. R. C. Smith, Jr.*  
DIRECTOR OF PUBLIC WORKS

5-2-00  
DATE

*V. Hudson Myers, Jr.*  
DEP. DIRECTOR, PUBLIC WORKS

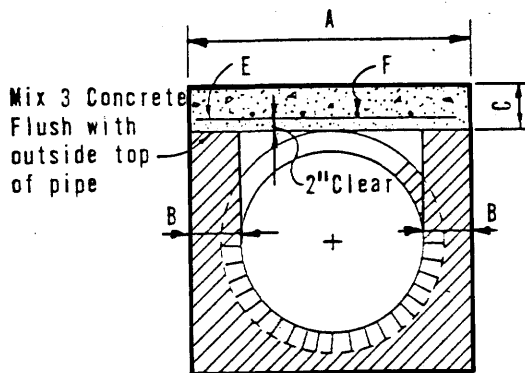
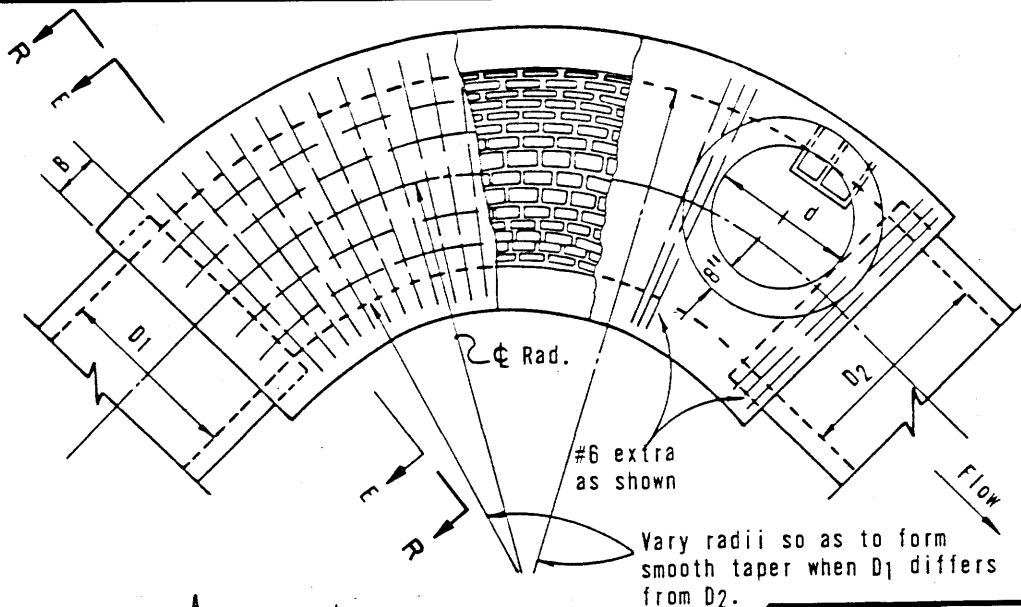
4/12/00  
DATE



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

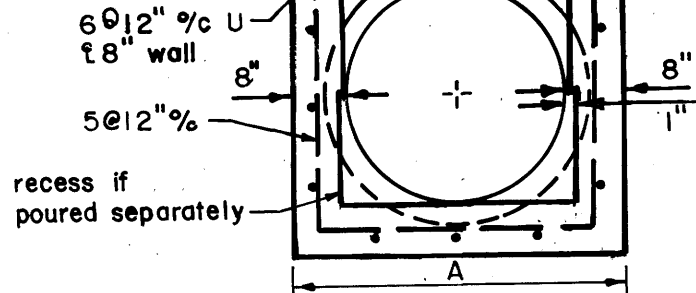
# MANHOLE & INLET STEP

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-51



SECTION E-E

PLAN



SECTION R-R

- NOTES:
1. Material- Walls and bottom shall be brick or plain concrete. (See Section E-E.) Where 12" thickness is required, 8" Reinforced Concrete may be substituted. (See Section R-R.)
  2. Loads- Superload=A.A.S.H.O. H-20 Fill Load=0 to 15 ft. Earth.
  3. Manhole Details- Steps, frame, cover, walls, max. batter shall be as shown on contract drawings for type A manhole.
  4. Bend Data, centerline radius, B, C, and reinforcement shall be governed by D-1 or D-2 whichever is smaller.
  5. Manhole opening d shall be based on downstream pipe size D-2.
  6. Frame and Grate for manhole on 54" and larger bends shall be 2'-6" with lettering and holes as shown for 2'-0" frame.
  7. Manhole stack shall conform to that of Type C manhole. minimum length of curve is 4'-0" for type c manhole stack.

Pipe Dia.	Radius	A	B	C	Bars E Spacing	Bars F	d
30"	5'-0"	3'-10"	8"	8"	#5 @ 6" o/c	3-#5	2'-6"
33"	6'-0"	4'-1"	8"	8"	#5 @ 6" o/c	3-#5	2'-6"
36"	6'-0"	4'-4"	8"	8"	#5 @ 6" o/c	3-#5	3'-0"
42"	7'-0"	4'-10"	8"	10"	#5 @ 6" o/c	4-#5	3'-0"
48"	8'-0"	5'-4"	8"	10"	#5 @ 6" o/c	4-#5	3'-0"
54"	9'-0"	6'-6"	12"	10"	#5 @ 6" o/c	5-#5	3'-0"
60"	10'-0"	7'-0"	12"	12"	#6 @ 8" o/c	6-#5	3'-0"
66"	11'-0"	7'-6"	12"	12"	#6 @ 8" o/c	7-#5	3'-0"
72"	12'-0"	8'-0"	12"	12"	#6 @ 8" o/c	7-#5	3'-0"

(x) SEE NOTE #1

*W. C. Allen Jr.* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*D. Hudson Myers Jr.* 9/2/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

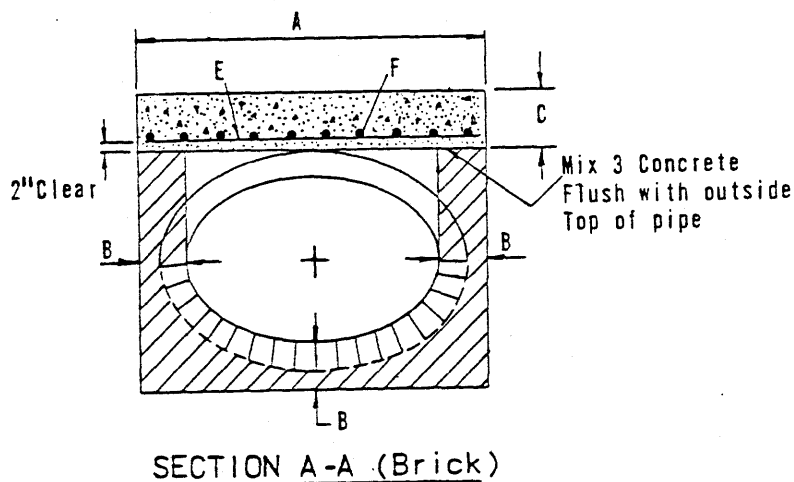
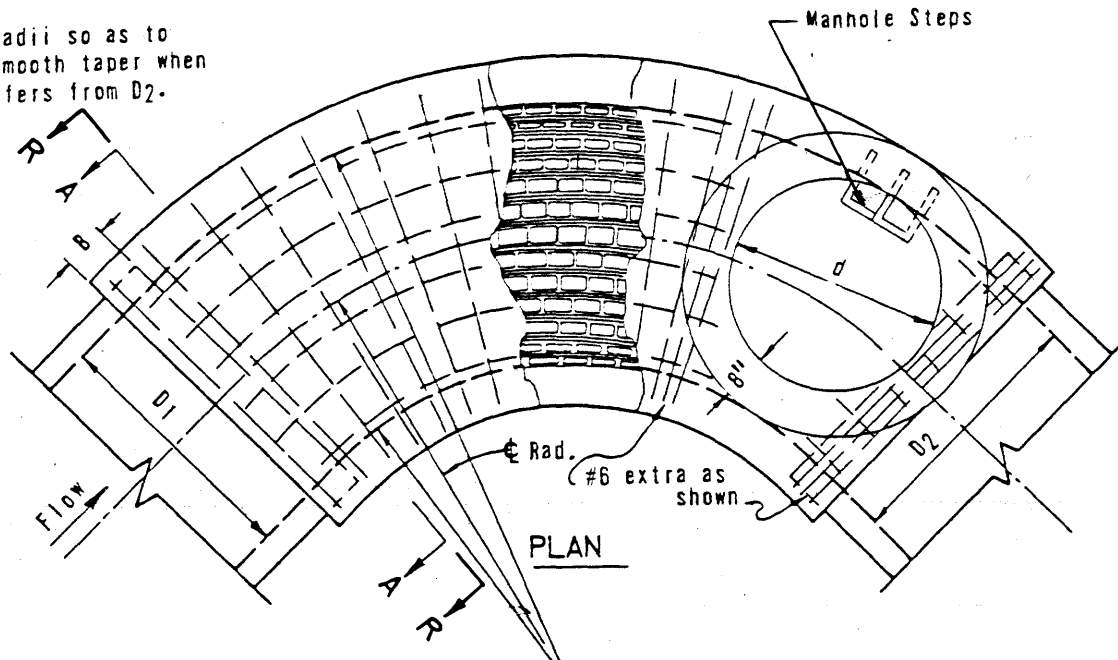


HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

BEND STRUCTURE  
 CIRCULAR PIPE

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-52

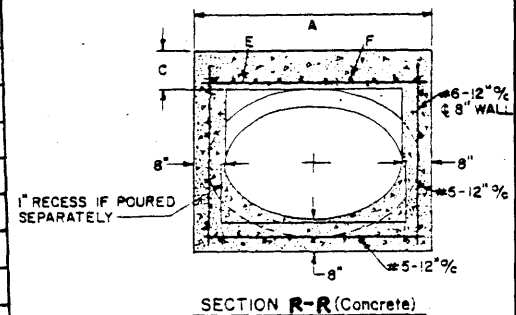
Vary Radii so as to form smooth taper when D<sub>1</sub> differs from D<sub>2</sub>.



#### NOTES:

1. Walls and bottom shall be brick or concrete. Where 12" brick thickness is required, 8" Reinforced Concrete may be substituted.
2. Loads superload = A.A.S.H.O. H-20; Fill Load = 0 to 15 ft. Earth.
3. Bend Data,  $\phi$  Rad., B, C and Reinforcing shall be based upon D<sub>1</sub> or D<sub>2</sub>, whichever is smaller.

Pipe Dimen.	$\phi$ Rad.	A	B	C	Bars E Spacing	Bars F Spacing	d
38"x24"	6'-0"	4'-8"	8"	10"	#5@6"	#5@8"	3'-0"
42"x27"	7'-0"	4'-10"	8"	10"	#5@6"	#5@8"	3'-0"
45"x29"	8'-0"	5'-1"	8"	10"	#5@6"	#5@8"	3'-0"
53"x34"	9'-0"	5'-9"	8"	10"	#5@6"	#5@8"	3'-0"
60"x38"	10'-0"	6'-4"	8"	12"	#6@8"	#6@10"	3'-0"
68"x43"	11'-0"	7'-8"	12"	12"	#6@8"	#6@10"	3'-0"
76"x48"	12'-0"	8'-4"	12"	12"	#6@8"	#6@10"	3'-0"
83"x53"	13'-0"	8'-11"	12"	12"	#6@8"	#6@10"	3'-0"
91"x58"	14'-0"	9'-7"	12"	12"	#6@8"	#6@10"	3'-0"



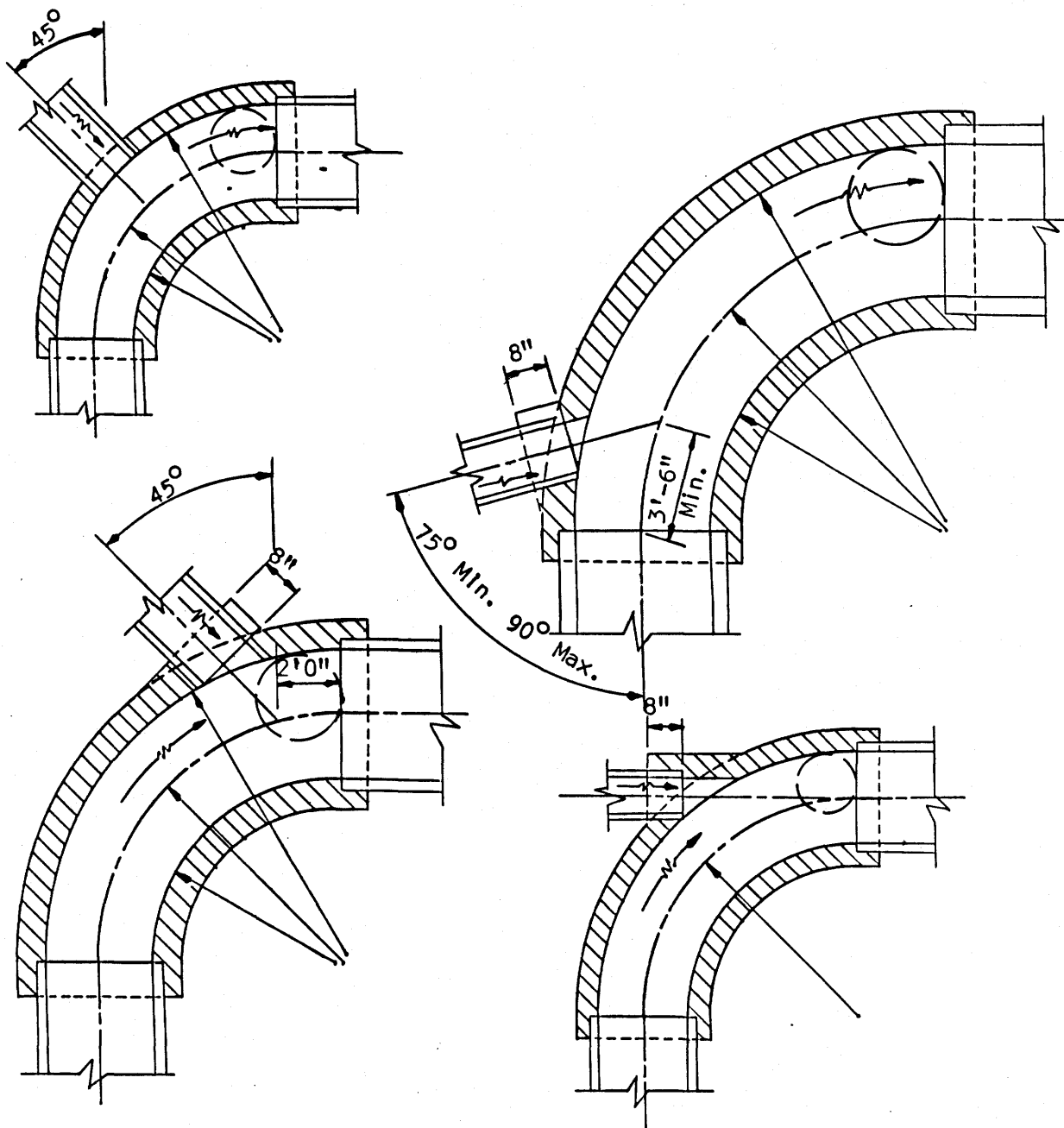
*W. L. Adams* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*D. J. Wynn, Jr.* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

BEND STRUCTURE  
 ELLIPTICAL PIPE

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-53



# Notes

Manhole location, size and details, concrete and reinforcing steel requirements, center line radius and other details shall be in accordance with Bend Structure Detail D-52 & D-53.

*[Signature]* 8-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4-13-00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

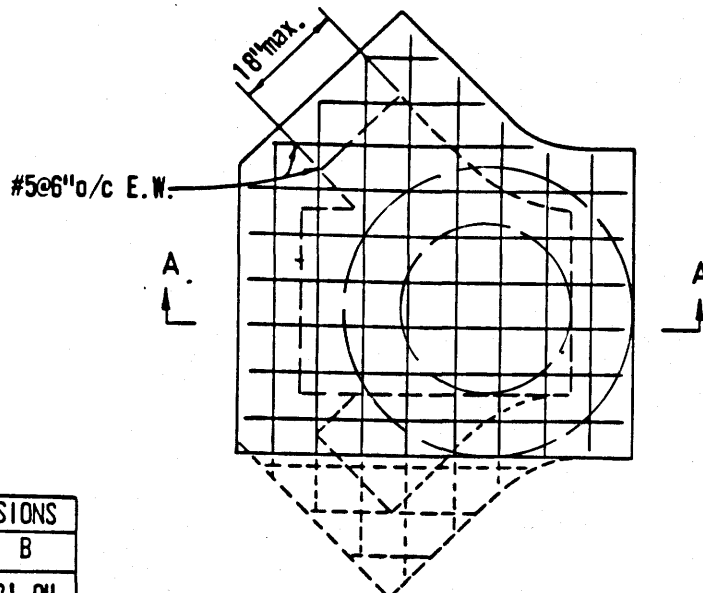


HARFORD COUNTY, MD  
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 PUBLIC WORKS

CONNECTION LOCATIONS  
 TO BEND STRUCTURES

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-54



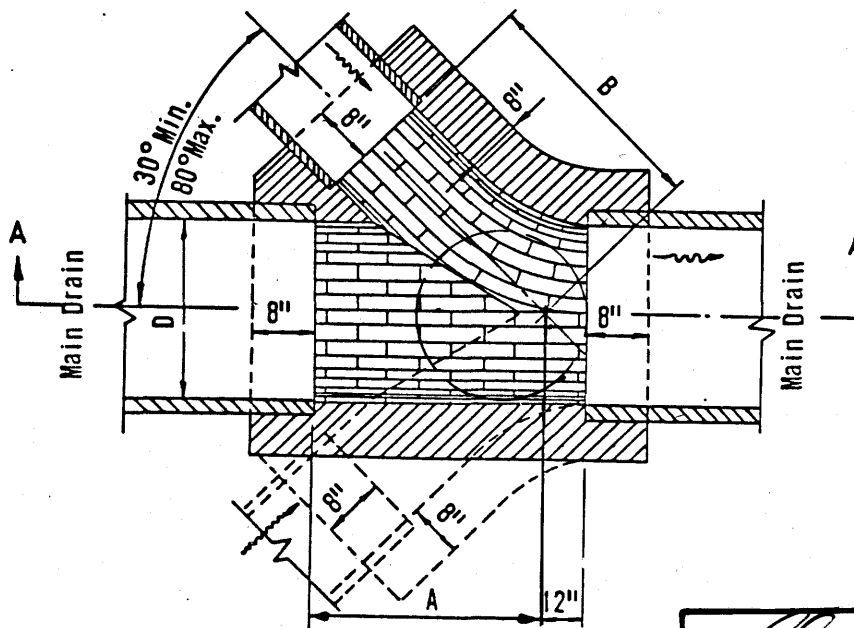


**NOTES:**

1. Walls and bottom shall be Brick or Mix 3 Concrete
2. Manhole stack and additional slab reinforcing shall conform to that of Type C Manhole.
3. Walls and bottom shall conform to the Standard Bend Structure Detail.

MINIMUM DIMENSIONS		
D	A	B
15'-18"	3'-9"	2'-9"
21'-30"	4'-4"	3'-7"
33'-36"	4'-7"	3'-11"

**PLAN OF ROOF SLAB REINFORCING**



**PLAN**

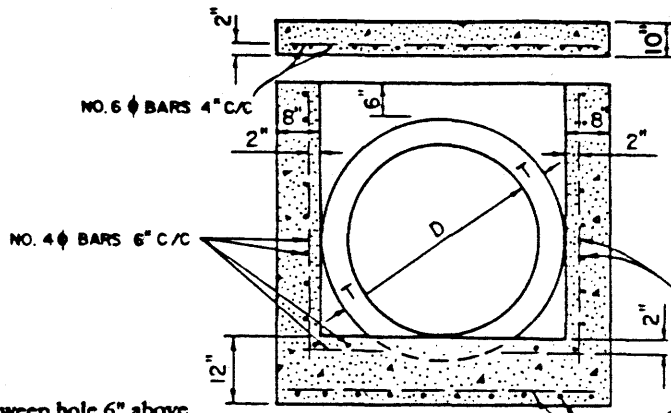
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DIRECTOR OF PUBLIC WORKS	DATE
<i>[Signature]</i>	
DEP. DIRECTOR, PUBLIC WORKS	DATE



**HARFORD COUNTY, MD**  
**DEPARTMENT OF**  
**PUBLIC WORKS**

**JUNCTION CHAMBER**  
**SINGLE & DOUBLE**

ISSUED	_____
REVISED	_____
REVISED	_____
<b>PLATE</b>	<b>D-55</b>



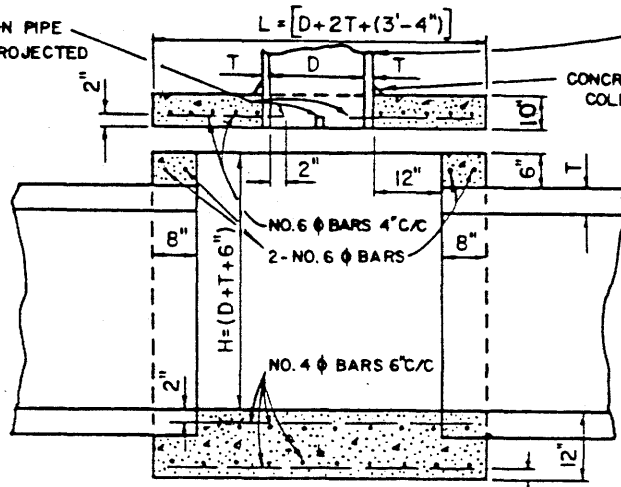
CONCRETE - SEE LATEST S.H.A. SPECIFICATIONS  
REINFORCEMENT-DEFORMED BARS

NOTE: NO PROVISION IS TO BE MADE IN SLAB FOR INTAKE PIPE WHEN NOT NEEDED.

Provide a 1" diameter weep hole 6" above crown of pipe or as directed.

SECTION AT PIPE OPENING

SLOTS TO BE CUT IN PIPE TO CONFORM WITH PROJECTED STEEL.

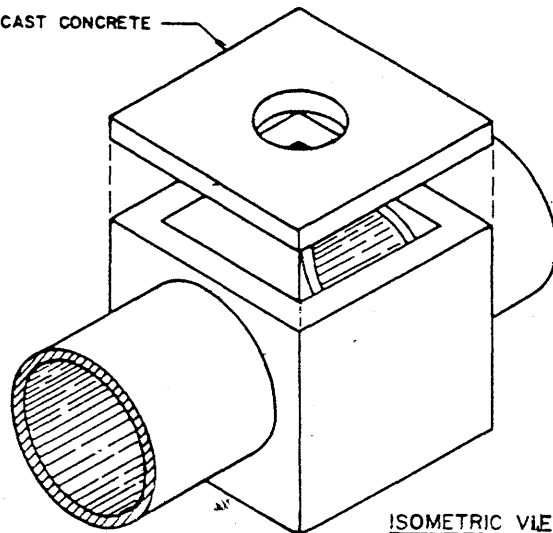


INTAKE PIPE  
STEEL TO PROJECT 2" THRU OPENING FOR PIPE AS SHOWN. PROJECTED STEEL TO BE PAINTED.

CONCRETE COLLAR

SECTION ALONG C OF PIPE

TOP SLAB, PRE-CAST CONCRETE



ISOMETRIC VIEW

NOTE:  
PRECASTING IS  
OPTIONAL.

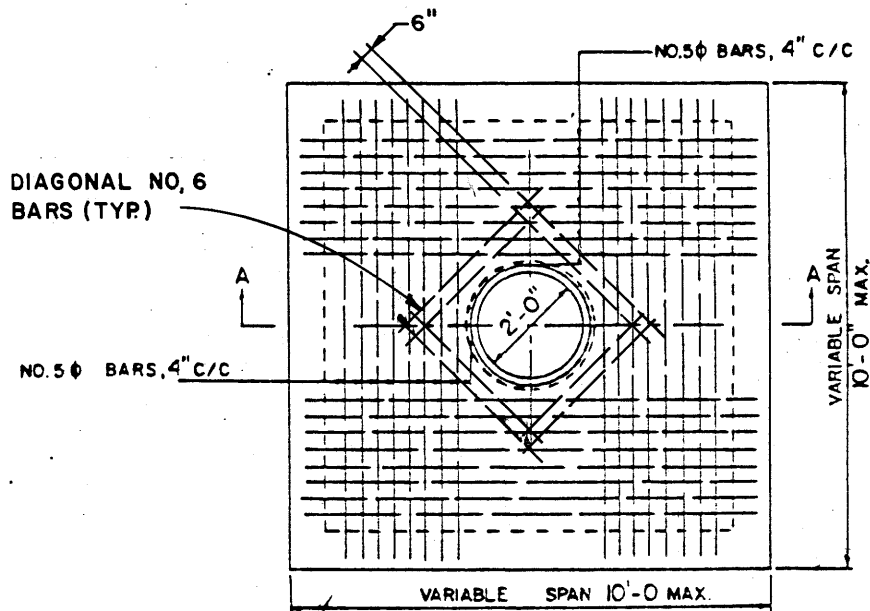
*W. L. Allen* 8-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. L. Allen, III* 4-1-05  
DEP. DIRECTOR, PUBLIC WORKS DATE



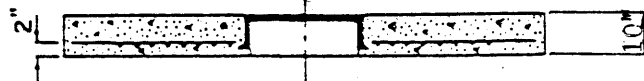
HARFORD COUNTY, MD  
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PUBLIC WORKS

STANDARD JUNCTION BOX

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-56



PLAN



SECTION A-A

GENERAL NOTES

REINFORCEMENT-DEFORMED BARS  
 MANHOLE CASTINGS-INSIDE DIA: 2'-0"  
 MANHOLE CASTINGS-MAX. DEPTH 0'-7"

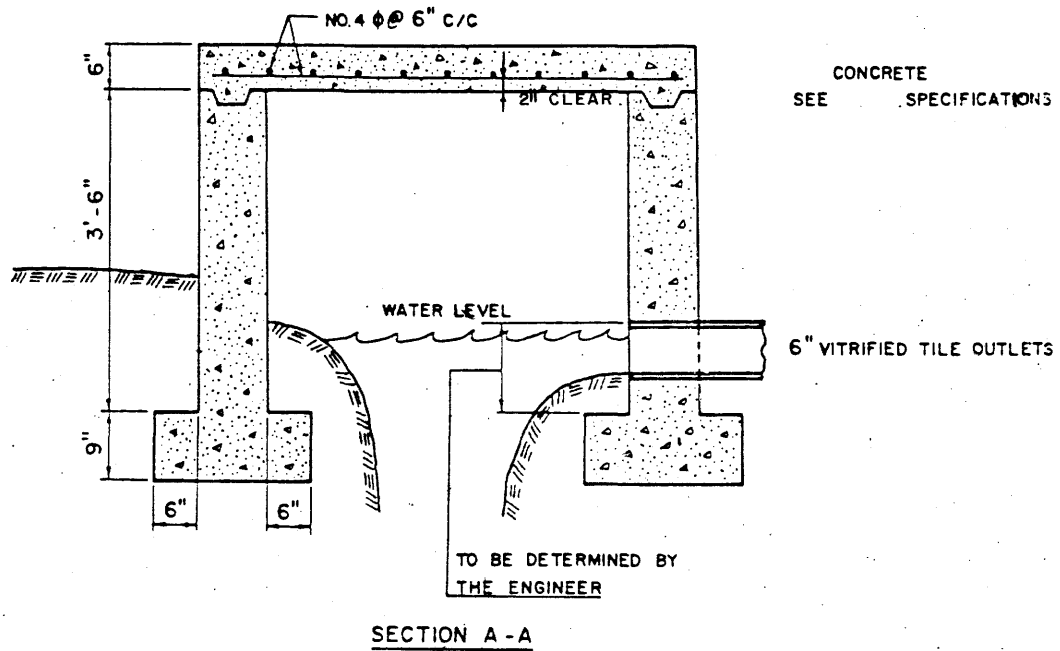
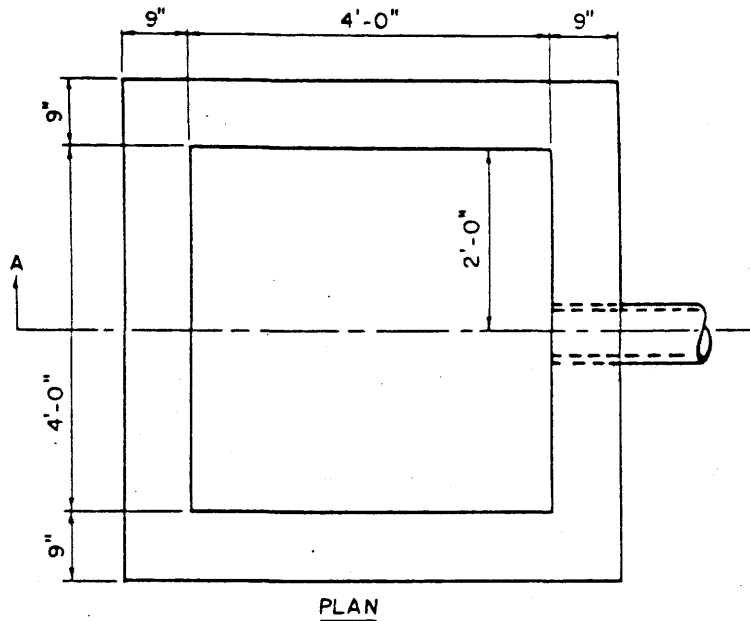
*[Signature]* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
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PRE-CAST REINFORCED  
 CONCRETE SLAB

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-57



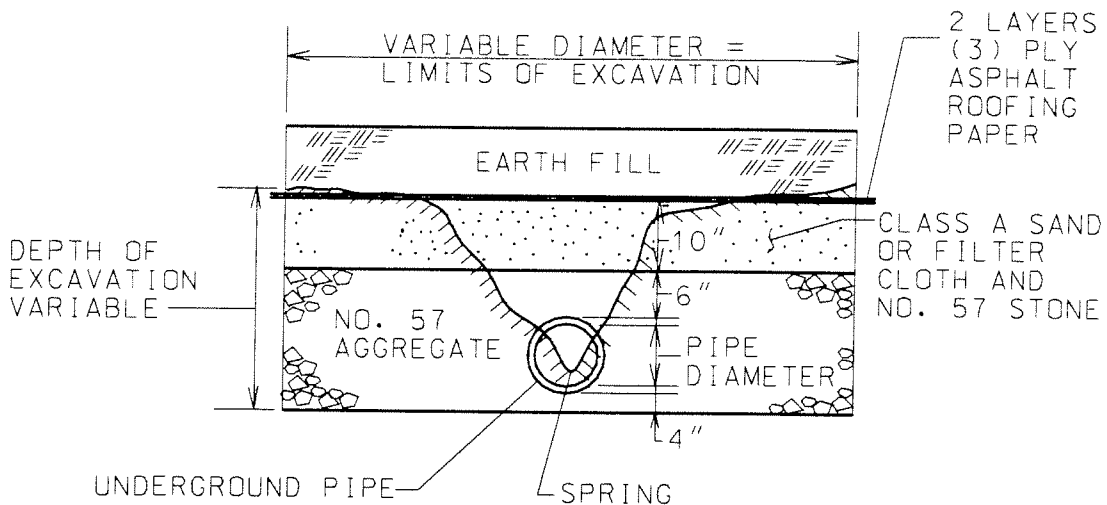
*H. J. [Signature]* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*W. [Signature]* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



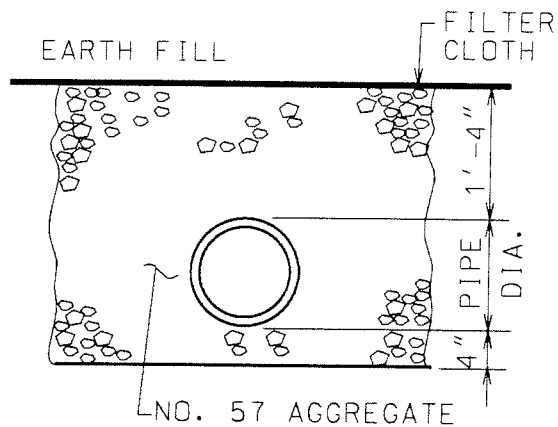
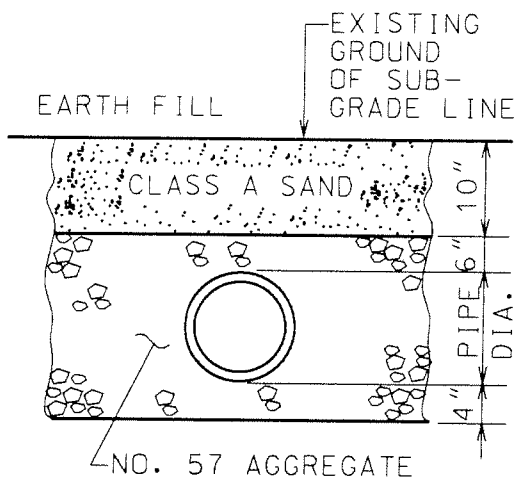
HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

STANDARD SPRING BOX  
 SPRING OR WELL PROTECTION

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-58



CIRCULAR PLAN VIEW NOT SHOWN.  
TO BE USED WHERE NOTED ON PLANS  
OR WHERE DIRECTED BY ENGINEER.



*W. W. H. H. H.* 5-200  
DIRECTOR OF PUBLIC WORKS DATE

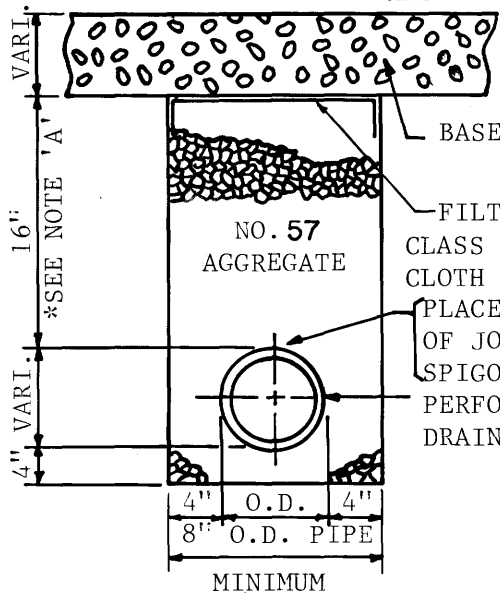
*W. W. H. H. H.* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



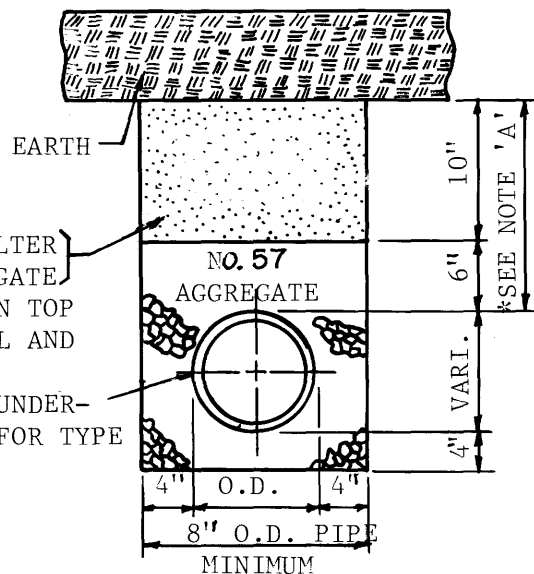
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

# SPRING CONTROL METHOD AND DETAIL

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D59

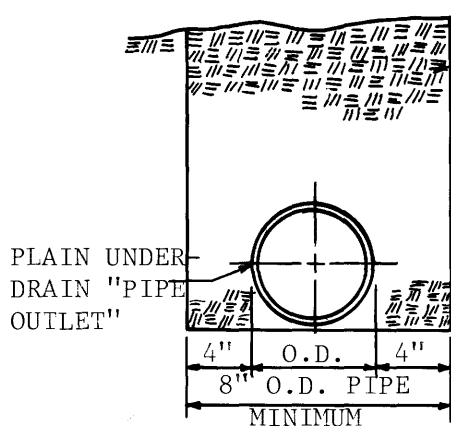


SUB-BASE DRAINAGE  
DITCH SECTION

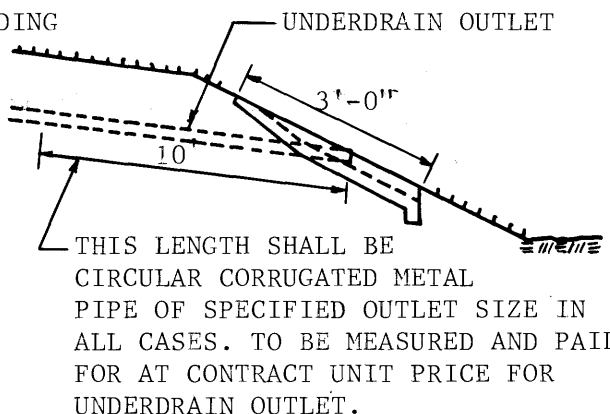


SUB-SURFACE DRAINAGE  
DITCH SECTION

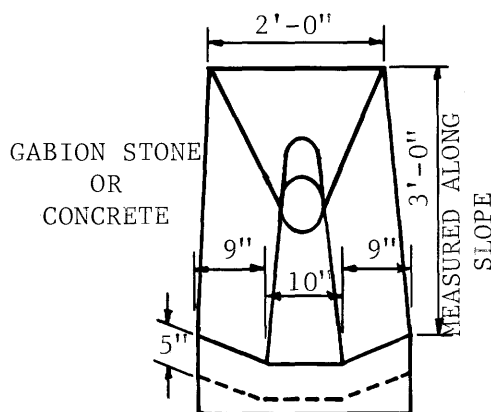
**\*\* ALL CONCRETE DENOTED WILL BE MIX NO. 3 \*\***



OUTLET DITCH SECTION



5" CONCRETE GUTTER FOR UNDERDRAIN OUTLET



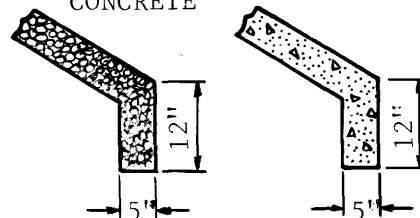
ELEVATION-UNDERDRAIN OUTLET

NOTE: UNDERDRAIN TO BE LAID ON A MINIMUM OF 0.5% GRADE UNLESS OTHERWISE DIRECTED.

\*NOTE 'A': WHERE UNDERDRAIN IS OUTLETTED INTO AN INLET, OR WHERE ANY OTHER UNUSUAL CONDITIONS PREVAIL, THESE DIMENSIONS MAY BE VARIED AS DIRECTED.

GABION

CONCRETE



TOE WALL



**HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS**

**STANDARD UNDERDRAINS**

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
**PLATE D-60**

RESERVED FOR FUTURE USE

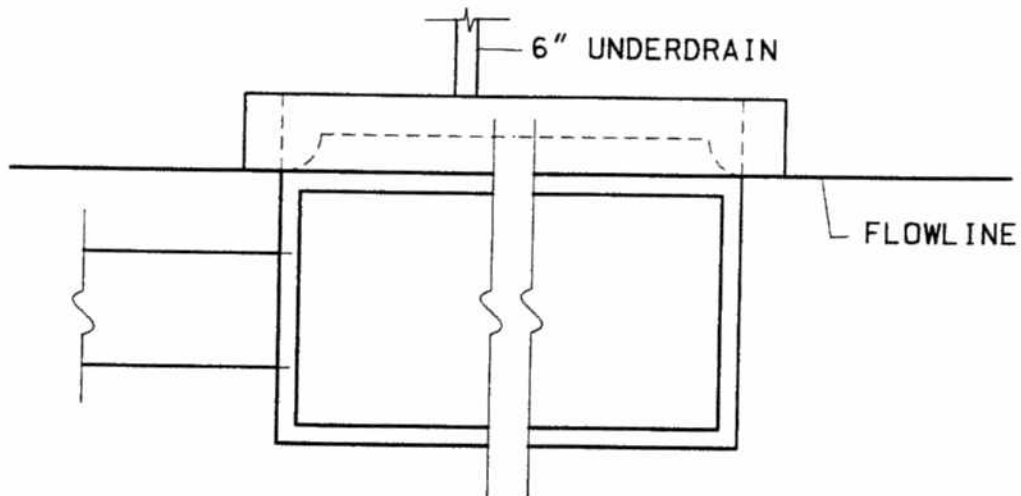
DIRECTOR OF PUBLIC WORKS      DATE

DEP. DIRECTOR, PUBLIC WORKS      DATE

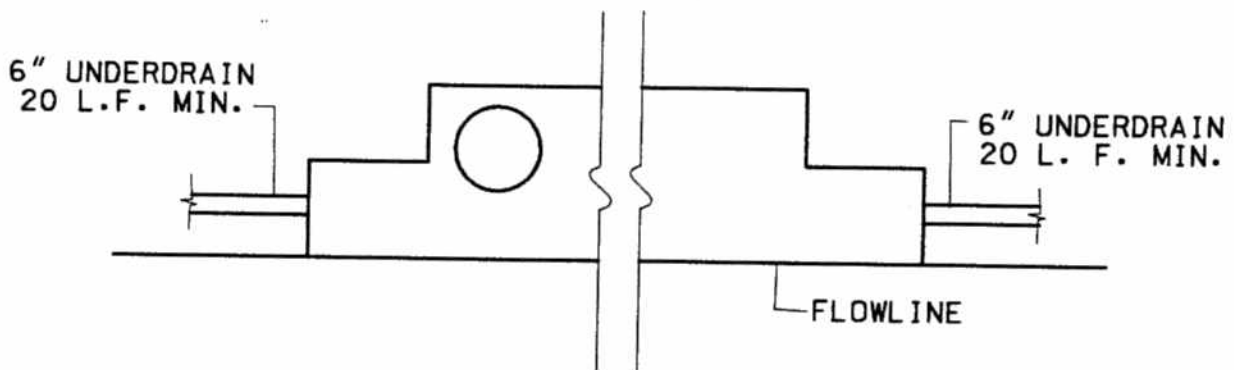


HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-61



PLACEMENT AT COMBINATION INLETS



PLACEMENT AT COS OR COG INLETS

*[Signature]* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

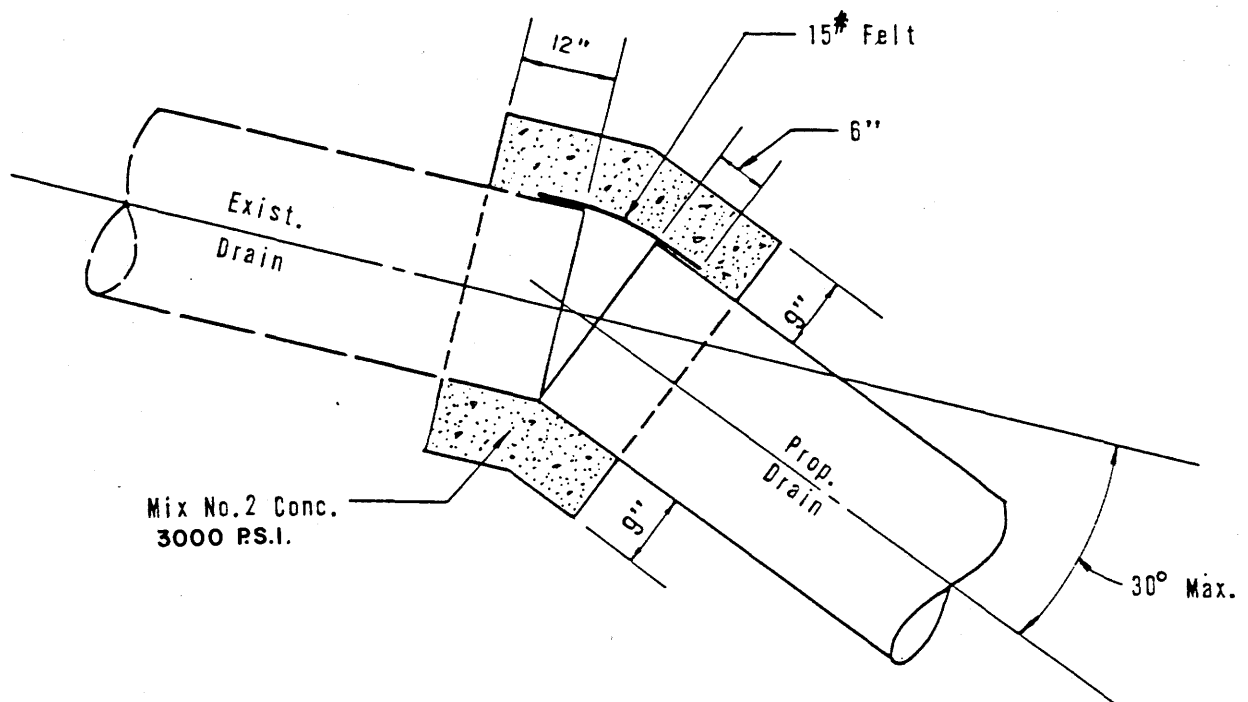


HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

STANDARD PLACEMENT  
 UNDERDRAIN AT INLETS

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D62





NOTE: For drains over 24" D., use  
brick bend or manhole.

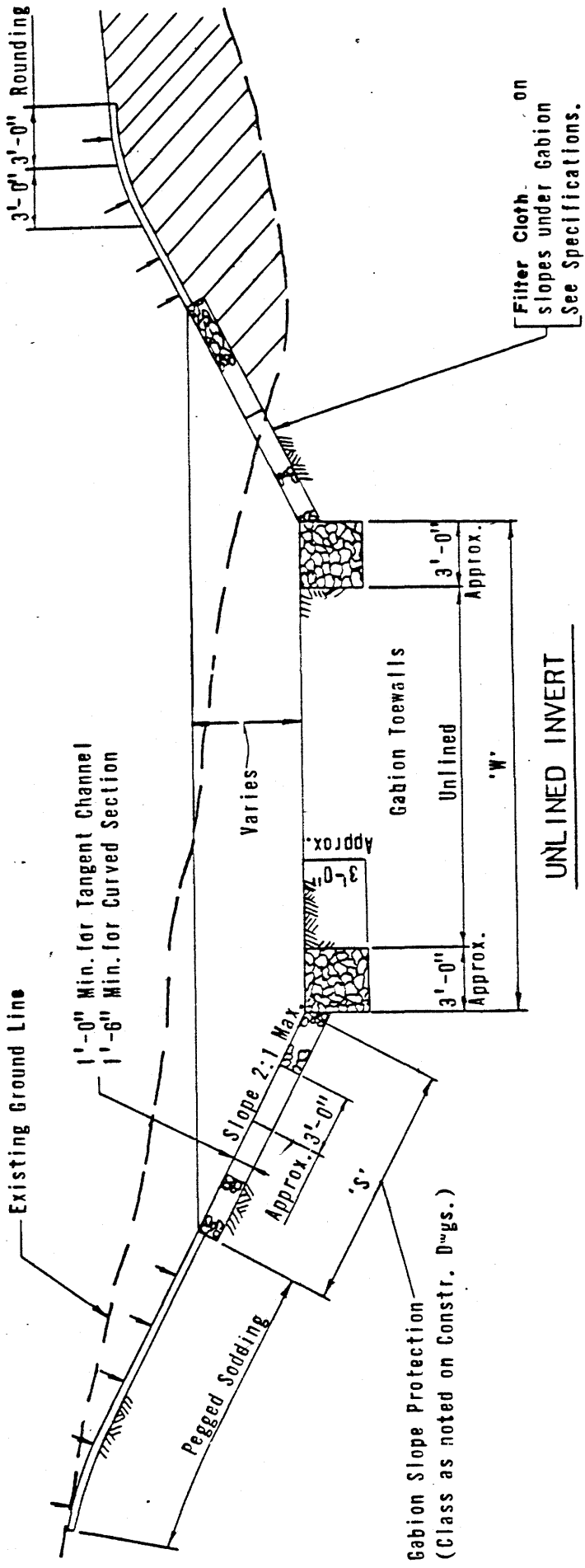
*LRKAD 4.* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. H. Myer, III* 4/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



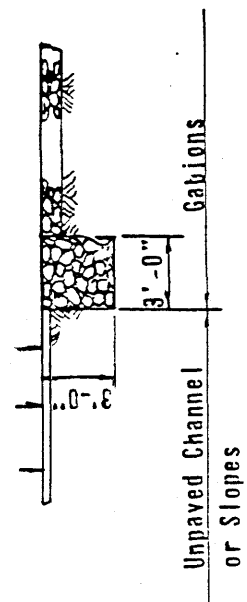
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

CONCRETE COLLAR  
24" DRAIN AND UNDER

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE D-63

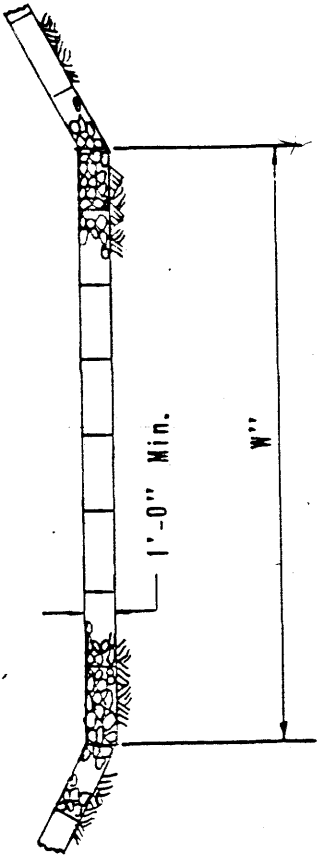


NOTE:  
 'W' denotes channel widths, and need not be in 3'-0" multiples



END TOEWALL DETAIL

LINED INVERT



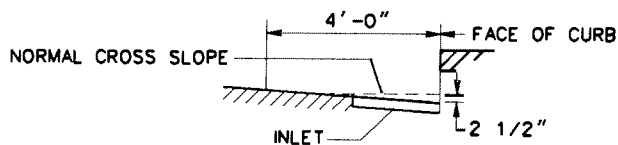
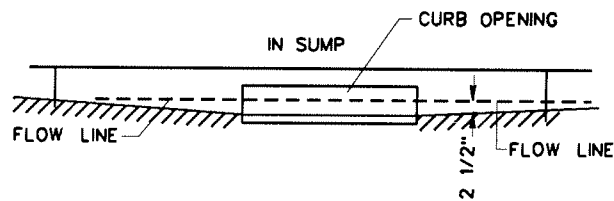
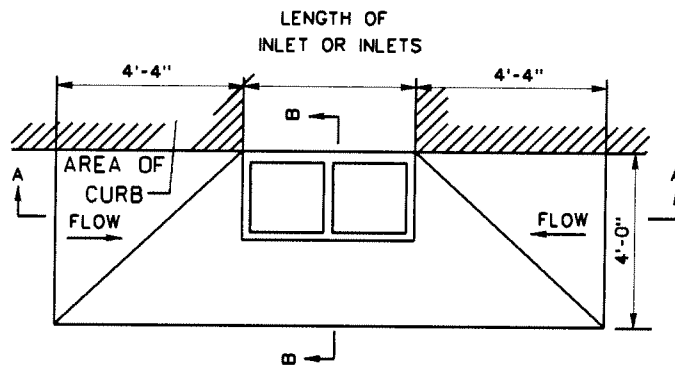
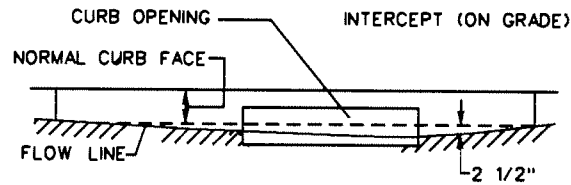
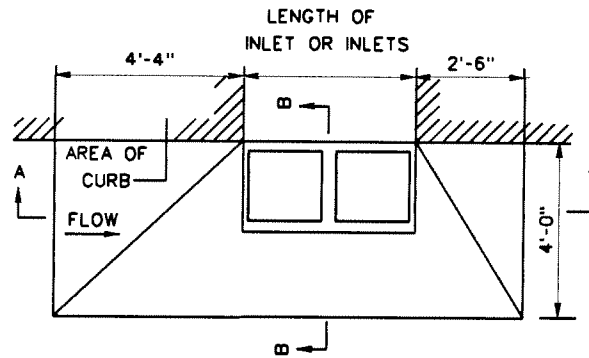
*L.R. - Alford*  
 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*D. J. ...*  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

GABION CHANNEL LINING

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-64



*William A. ...* 8-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*D. Hudson Myers, Jr.* 4/12/00  
 DEP. DIRECTOR PUBLIC WORKS DATE

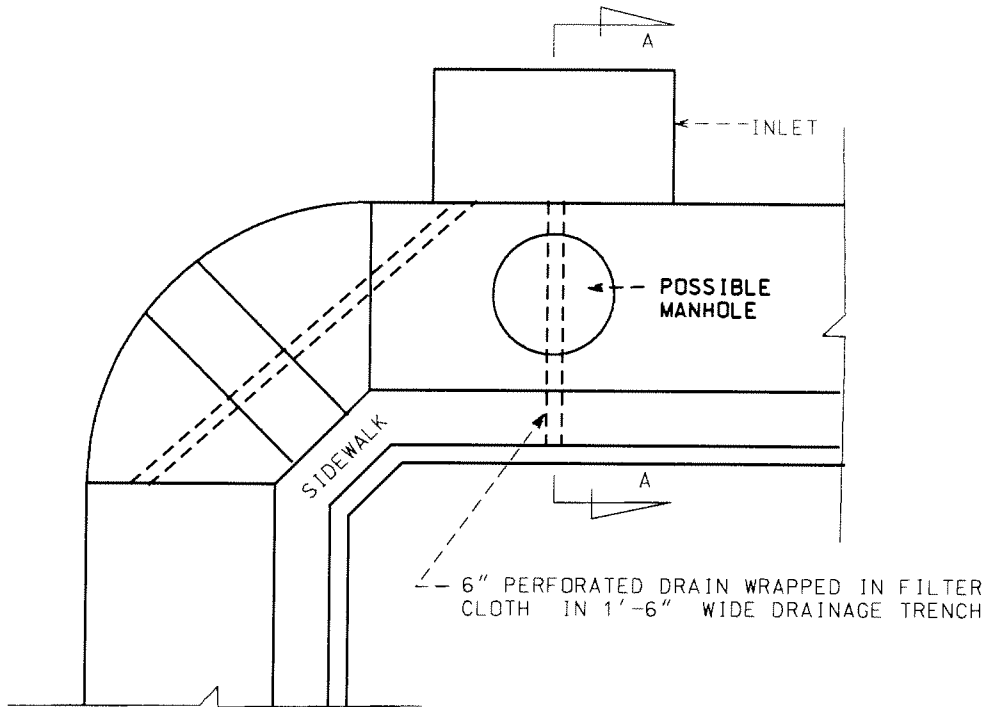


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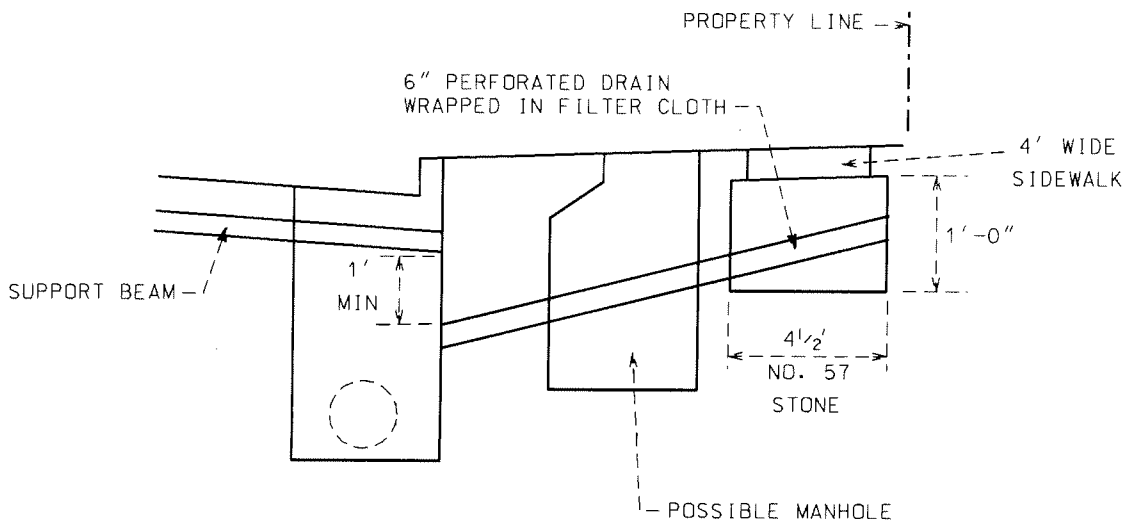
# METHOD FOR DEPRESSING PAVEMENT AT INLETS

FOR USE AT EXISTING INLETS ONLY

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-65



PLAN



SECTION A - A

*W. Allen J.* 5-2-00  
 DIRECTOR OF PUBLIC WORKS DATE  
*U. Hudson Myers, IV* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE



HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

SIDEWALK  
 PEDESTRIAN RAMP  
 UNDERDRAIN

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE D-66

**SECTION VI**

**STRUCTURES**

Plate

Standard "Year Built" Numerals.....ST-1

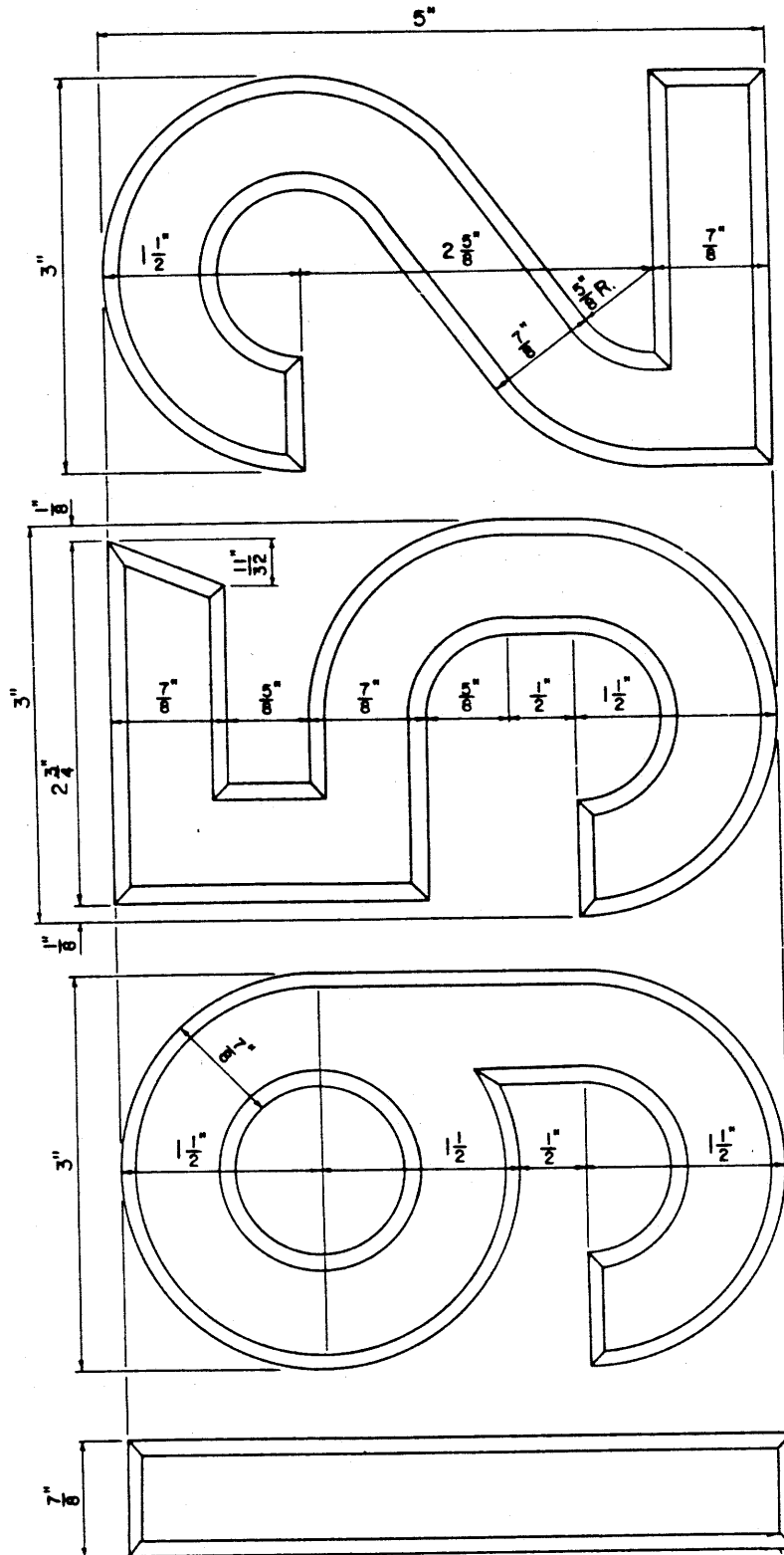
Standard "Year Built" Numerals.....ST-2

Standard "Year Built" Numerals.....ST-3

Standard "Year Built" Numerals.....ST-4

Concrete Bridge Parapet and Bridge Median  
Barrier Details .....ST-5

TO BE PLACED ON ALL STRUCTURES - AS DIRECTED BY THE ENGINEER



*[Signature]* 5-200  
 DIRECTOR OF PUBLIC WORKS DATE  
*[Signature]* 4/12/00  
 DEP. DIRECTOR, PUBLIC WORKS DATE

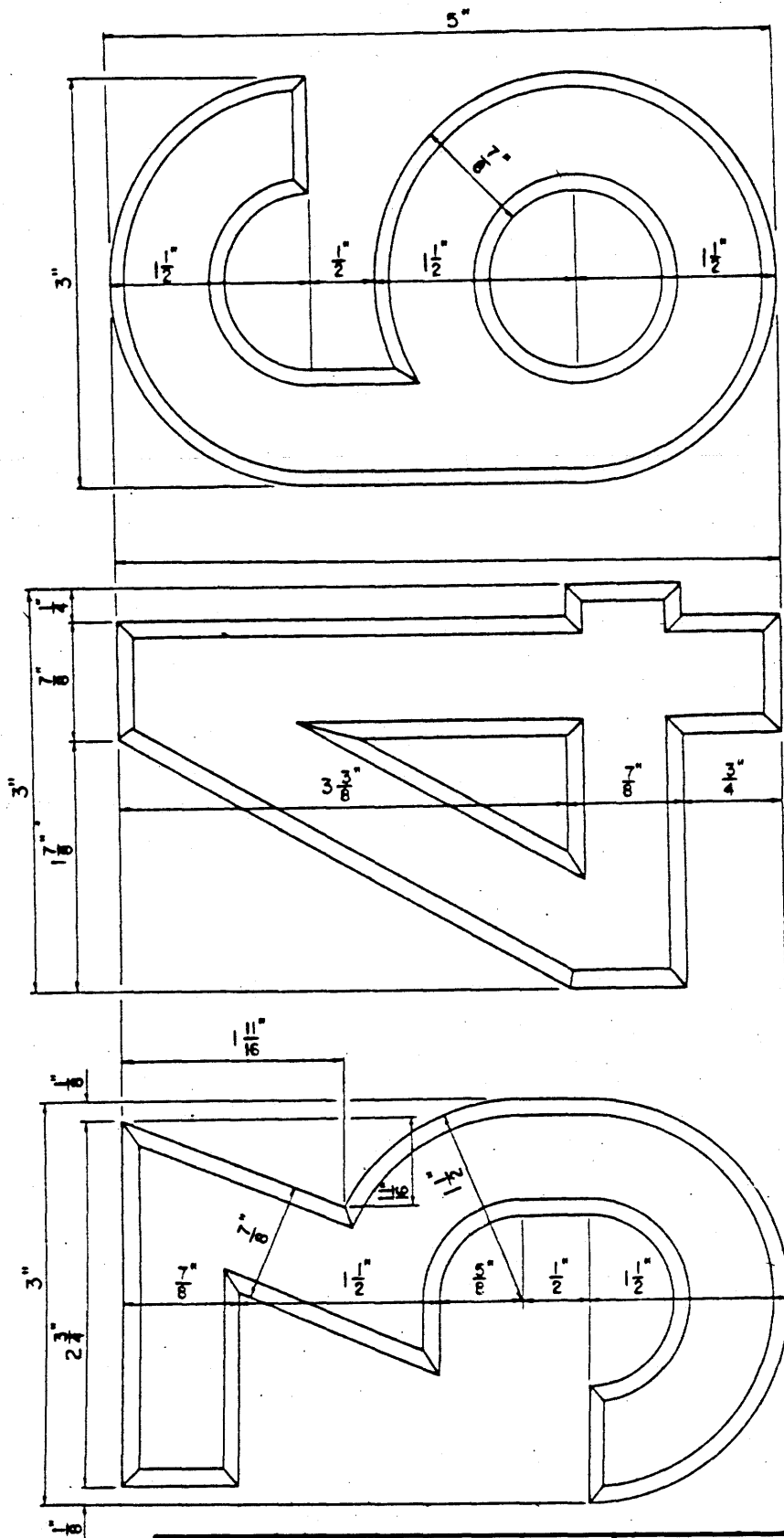


HARFORD COUNTY, MD  
 DEPARTMENT OF  
 PUBLIC WORKS

STANDARD  
 "YEAR BUILT"  
 NUMERALS

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE ST-1

TO BE PLACED ON ALL STRUCTURES - AS DIRECTED BY THE ENGINEER



*[Signature]* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 1/12/00  
DEP. DIRECTOR, PUBLIC WORKS DATE

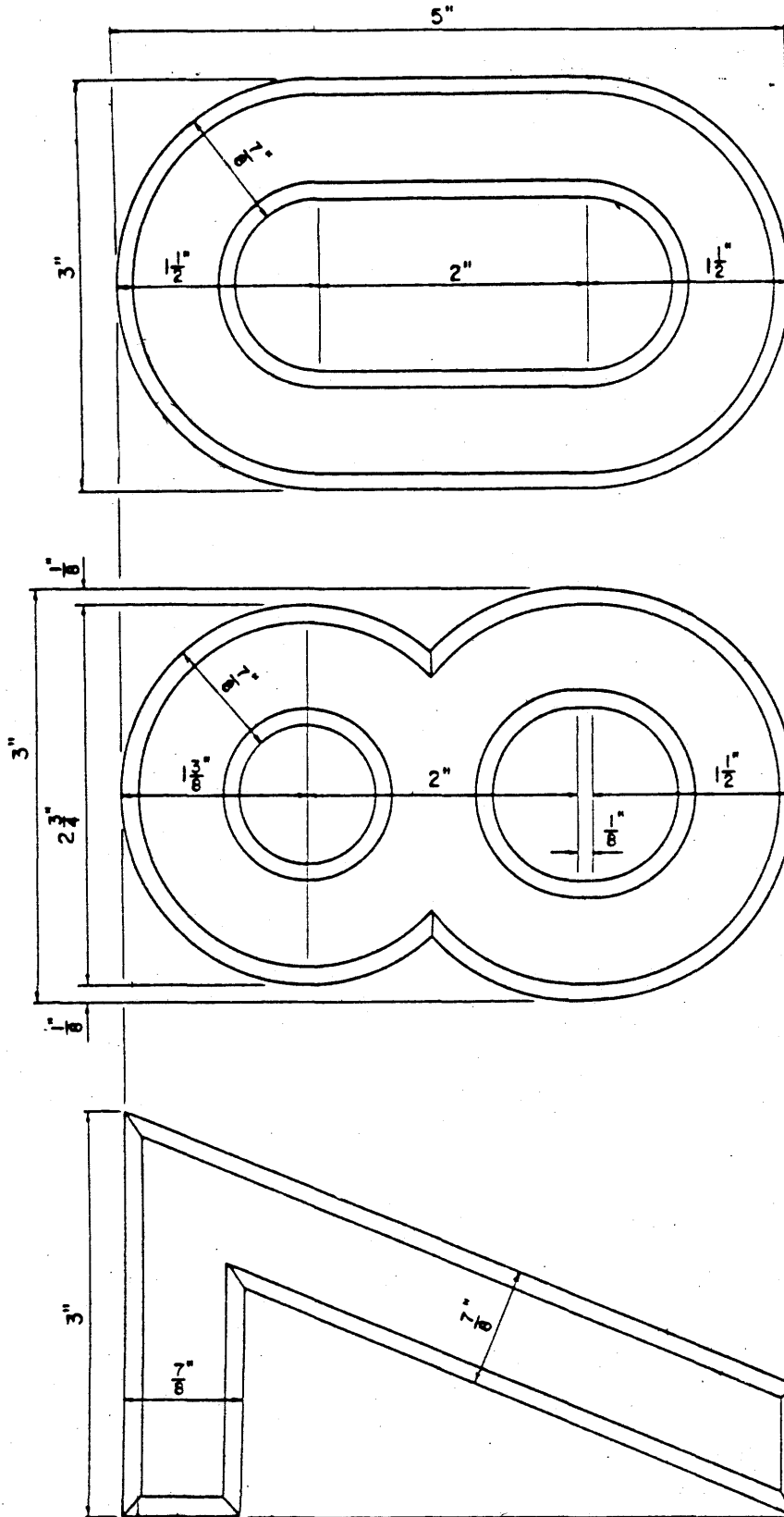


HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

STANDARD  
"YEAR BUILT"  
NUMERALS

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE ST - 2

TO BE PLACED ON ALL STRUCTURES - AS DIRECTED BY THE ENGINEER



*L. L. Allen* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE

*H. Hubert M. M. III* 4/2/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



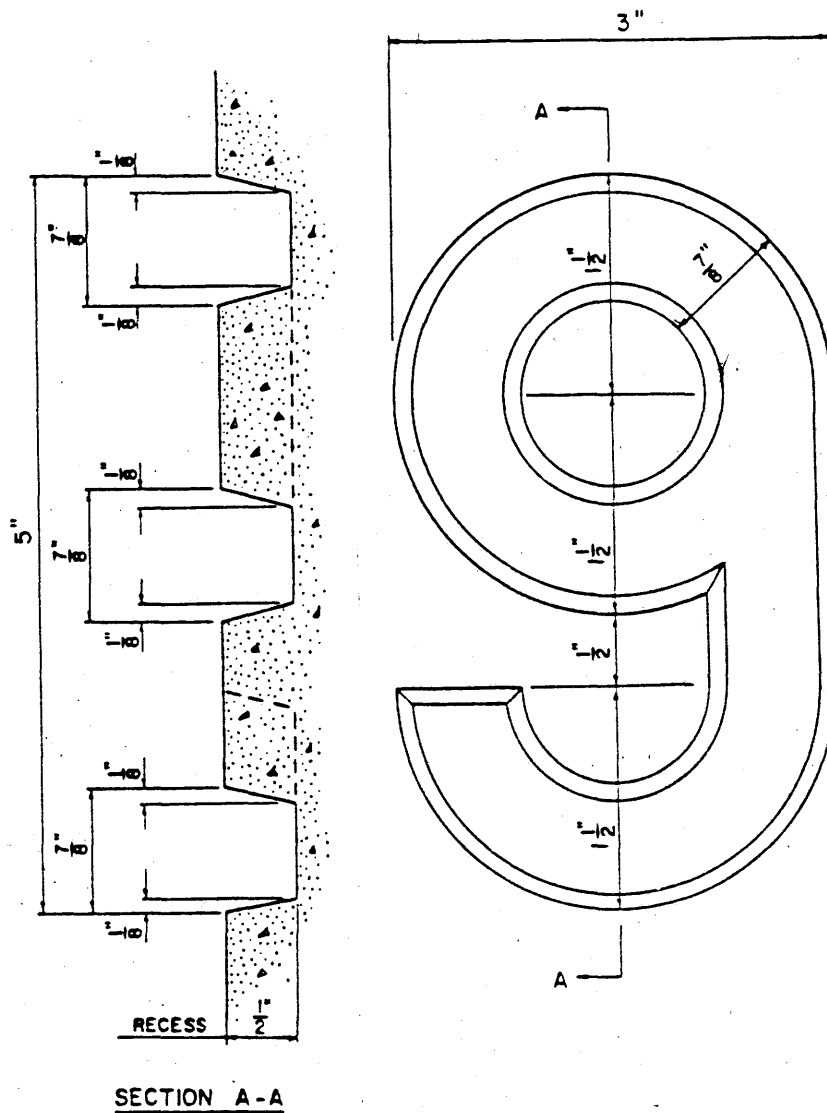
HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

STANDARD  
"YEAR BUILT"  
NUMERALS

ISSUED \_\_\_\_\_  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_  
PLATE ST-3



*W. L. C. Spence* 5-2-00  
DIRECTOR OF PUBLIC WORKS DATE  
*W. L. C. Spence* 4/14/00  
DEP. DIRECTOR, PUBLIC WORKS DATE



TO BE PLACED ON ALL STRUCTURES - AS DIRECTED BY THE ENGINEER



HARFORD COUNTY, MD  
DEPARTMENT OF  
PUBLIC WORKS

STANDARD  
"YEAR BUILT"  
NUMERALS

ISSUED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_  
 PLATE ST-4

